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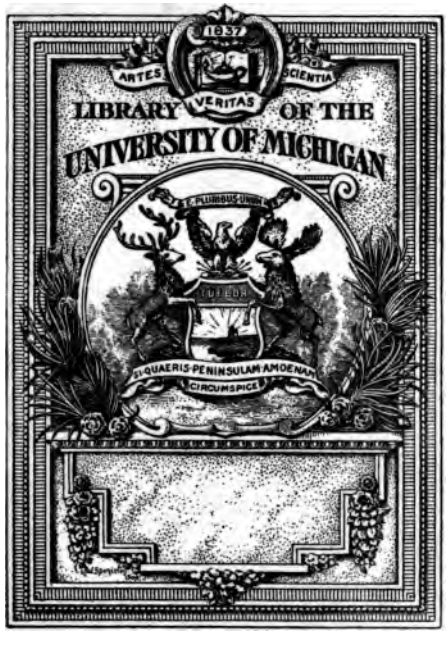
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XII

FREIGHT CLASSIFICATION

A STUDY OF UNDERLYING PRINCIPLES

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BY
J. F. STROMBECK

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TO

DEAN THOMAS FRANKLIN HOLGATE

NORTHWESTERN UNIVERSITY

PREFACE

THIS series of books owes its existence to the generosity of Messrs. Hart, Schaffner and Marx of Chicago, who have shown a special interest in trying to draw the attention of American youth to the study of economic and commercial subjects. For this purpose they have delegated to the undersigned committee the task of selecting or approving of topics, making announcements and awarding prizes annually for those who wish to compete.

For the year ending June 1, 1910, there were offered:

In Class A, which included any American without restriction, a first prize of $600 and a second prize of $400.

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The present volume, submitted in Class B, was awarded the first prize in that class.

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Harvard University.

NOTE

In preparing this essay it has been the aim of the writer to treat the subject in a scientific way, showing how the economic laws apply to classification of freight, and at the same time use terms and illustrations that can be understood and appreciated by a layman. If the reader should at times feel a lack of definiteness, he must remember that freight rates have not as yet been reduced to an exact science, and no general and positive rules can be made. Each and every case must be considered by itself and the rate fixed after a weighing of all factors involved.

Acknowledgment is due to Professors W. E. Hotchkiss and F. S. Deibler of Northwestern University for kind assistance and valuable suggestions.

CONTENTS

I. Introduction 1

II. Fundamental Principles 9

III. Elements Determining Relative Minimum Rates 35

IV. Elements of Reasonableness — Competition . 61

V. Elements of Reasonableness, etc. — *continued* . 82

VI. Comparison, the Method of Classification . . 108

Appendix A 123

Appendix B 124

Appendix C 127

Index 129

FREIGHT CLASSIFICATION

CHAPTER I

INTRODUCTION

FREIGHT publications are of three kinds: classifications, class tariffs, and commodity tariffs. The freight classification enumerates, in an alphabetical list, all articles of traffic, and, as the name implies, merely distributes them into different classes as a basis for assessing and collecting freight charges. It governs, not between specified stations, but over a given territory, which is usually extensive. Thus what is known as the Official Classification governs, generally speaking, on shipments moving within the territory east of the Mississippi and north of the Ohio and Potomac rivers. It places dry goods in first class; shredded wheat biscuits, less than carload lots, in second class; glucose, less than carload lots, in third class; iron and steel bars, less than carload lots, in fourth class; agricultural implements, carload lots, in fifth class, and pig iron, carload lots, in sixth class.

Class tariffs quote rates according to the classes provided in the classification. These class rates are in cents per 100 pounds, and apply between specified stations within the territory in which the particular classification governs; e.g., the rates for first, second, third, fourth, fifth, and sixth class freight from New York to Chicago are, respectively, 75, 65, 50, 35, 30 and 25 cents per 100 pounds. From this it is clearly seen that classifications and class tariffs are complementary to each other, and neither is complete without the other — neither can be used without

the other. To determine the rate on dry goods from New York to Chicago, it is necessary, first, to find from the Official Classification in what class that commodity is placed. Having found this to be the first class, one then refers to the class tariff, which shows that the rate for first-class articles from New York to Chicago is 75 cents per 100 pounds.

The commodity tariff differs from the other two in that it quotes the rate on the particular commodity between specified stations without the use of any other publication. To illustrate: a commodity tariff on lumber shows the rates on lumber from a shipping point A to receiving stations B, C, and D as being 20, 25, and 28 cents per 100 pounds, respectively. The functions of the classification and of the class tariff are combined in the commodity tariff. By far the largest tonnage of such commodities as coal, lumber, grain, live-stock, packing-house products, etc., which usually move in large volumes, is carried on rates provided for in commodity tariffs. Commodity tariffs are also extensively used whenever it is necessary to make exceptionally low rates on particular commodities between given points.

The above suggests that freight rates may be considered from two points of view. The classification merely provides that a commodity shall be placed in a given class, which takes either a higher or a lower rate than that applying to the class in which some other commodity is placed. In other words, the classification provides what relation shall exist between the rates on given commodities. A study of the principles of classification is thus a study of relative rates. The class tariff quotes the exact rate in cents per 100 pounds, and has nothing to do with the relation between rates on different commodities. These class rates may be called absolute rates. The rates in the commodity tariffs are both relative and absolute, for they determine the relation between the rates on the commodities which are provided for in them and the rates on all

other traffic, and at the same time, they quote an exact rate in cents per 100 pounds.

Freight classification has had a gradual development. It has been recognized from the earliest days of turnpikes, different vehicles having been placed in different categories.[1] The early canal companies carried this idea still farther by basing their rates somewhat upon the value of the service and assessing the heaviest tolls upon the most valuable goods.[2] In some parts of this country freight was carried in the early days by wagon along turnpikes, at a toll, for each 100 miles carried, of 20 cents per cubic foot for light articles and $1 per 100 pounds for heavy articles. When the state legislatures granted charters to the early railroads, they sometimes fixed maximum charges on this basis. The charter granted by South Carolina, in 1827, to the South Carolina Railroad provided that freight charges, per 100 miles, should not exceed 10 cents per cubic foot for light articles and 50 cents per 100 pounds for heavy articles.

The improved facilities for transportation brought about an increase, not only in the volume, but also in the variety of commodities offered for shipment. This increase in traffic necessitated a more comprehensive and detailed scheme for assessing rates. In a tariff publication issued by the above named railroad in 1855, four classes are found, for all of which the rates are in cents per 100 pounds. This tariff shows rates on less than 300 articles. Before many years had passed, varied agriculture and manufacture caused a still further and much greater increase in the number of articles of traffic, and it became necessary to list alphabetically the articles offered, indicate their respective classes in one publication and show the class rates in another.[3] In this way, each railroad developed its

[1] Noyes, *American Railroad Rates*, p. 5.

[2] Noyes, *ibid.*, gives on pp. 65 and 66 an interesting schedule of tonnage rates of the Sheffield Canal for 1815.

[3] McPherson, *Railroad Freight Rates in Relation to the Industry and Commerce of the United States*, pp. 148–152.

own individual classification applicable to local traffic. Just prior to the passage of the Act to Regulate Commerce in 1887, there were one hundred and thirty such classifications within the territory of the present Official Classification. In addition to these, each of five railroad associations had its own classification applicable mainly to through traffic,[1] but often also to local traffic.[2] Though freight tariffs had been greatly simplified by these classifications, the situation still remained very unsatisfactory and on April 1, 1887, most of the various classifications in this territory were combined into Official Classification No. 1.

At the present time there are three important classifications applying within the United States: the Official already mentioned; the Southern, applying, roughly speaking, in the territory south of the Ohio and Potomac rivers and east of the Mississippi River, and the Western, in the territory west of the Mississippi River.[3] Even after this great reduction in the number of classifications, much has been said concerning a uniform classification for the entire country. As early as 1887 the Interstate Commerce Commission said: "It is greatly to be regretted that the same classification is not adopted by the carriers by rail in all sections of the country. The desirability of uniformity is so great, that the suggestion is frequently heard that national legislation should provide and compel it." [4]

Because public authorities were not satisfied with the progress made toward uniformity in 1887 and 1888, at which time the above three classifications had been adopted,[5]

[1] Through traffic is such as moves over more than one railroad and on which a single rate applies from shipping point to destination.

[2] Thurber *v.* N. Y. C. & H. R. R. Co., 2 Inters. Com. Rep. 742, p. 747; 3 I. C. C. Rep. 473 (1890).

[3] It might be mentioned that the railroad commissions of a few of the states have ordered special classifications for intrastate traffic. Also, many railways have issued "exception sheets" providing for exceptions to the main classifications which apply in the various parts of the country.

[4] *First Annual Report*, p. 30.

[5] What is now the Southern Classification was then known as the Southern Railway and Steamship Classification.

railway traffic officers undertook to frame a uniform classification, or, if this were not feasible, at least to make all practicable changes in the direction of unifying the various existing classifications. Repeated conferences, held during 1887 and 1888, resulted in the formation of a standing committee on uniform classification. The activity of the railways was stimulated by a resolution passed by the National House of Representatives, in 1888, requiring the Interstate Commerce Commission to prescribe a uniform classification by January 1, 1889. The Standing Committee on Uniform Classification voted to adopt a uniform classification, and had made considerable progress in classifying leading commodities when the members from the West became dissatisfied and withdrew. It was decided, nevertheless, to proceed with the formation of a classification, and after the work had been suspended and resumed from time to time, a proposed uniform classification, on the basis of eleven classes, was finally reported by the committee on June 18, 1890. This, it is understood, received the approval of all traffic associations except the Trunk Line. The Interstate Commerce Commission having intimated that it would seek authority to establish a uniform classification if the roads did not do so, the committee convened again in October, 1893, and once more submitted a report to the traffic associations. This report was, however, rejected by two of the associations.

The question of uniform classification continued to be agitated after this, but it was not until 1907 that it again was taken up seriously by the railways, the Interstate Commerce Commission, clothed with additional power by the Hepburn act, having once more intimated to the roads that unless they adopted a uniform classification, the Commission would prescribe one. A new committee was appointed, composed of five members from each of the three classification territories. This committee was instructed to do the preliminary work and to determine the principles on

which a uniform classification should be framed. In their report, dated March 31, 1908, this committee said: "With the knowledge derived from three months of earnest work, exhaustive investigation, and thorough discussion, your committee expresses the belief that while establishment of a uniform classification is impracticable at this time, it can ultimately be worked out along intelligent and satisfactory lines." The committee also said that it believed that there could be a unification of descriptions of articles, of minimum carload weights, and, with one exception, of classification rules,[1] and recommended that a committee

[1] At the present time there is considerable variance in the way articles are described in the three main classifications, and therefore in the manner in which they must be packed for shipment. To illustrate: iron castings, less than carload lots, not including such as are otherwise specifically provided for, are described and classified as follows:

In the Western Classification:

Light (under 100 lbs. each), loose	1 class
In bundles weighing less than 100 lbs.	1 "
Plain and heavy (each 100 lbs. or over)	4 "
In bags, boxes or casks	4 "
In bundles, N. O. S.	3 "
In barrels with canvas heads	3 "
In barrels with cleated heads	4 "
In barrels without tops	1 "

In the Official Classification:

In boxes, bbls. or in bulk in gunny bags	4 class
Loose, under 15 lbs. each	1 "
Loose, each weighing 15 lbs. or over	4 "
Securely wired together in bundles, weighing less than 15 lbs. per bundle	1 "
Securely wired together in bundles, weighing 15 lbs. or over per bundle	4 "

In the Southern Classification:

In kegs, bbls., casks, crates, sacks, or wired together in bdls.	4 class
Unpacked, each piece weighing 15 lbs. or less	2 "
Unpacked, each piece weighing over 15 lbs., but not over 200 lbs.	5 "
Unpacked, each piece weighing over 200 lbs.	6 "

On some commodities in carload lots, the Western and Official Classifications may provide for minimum carload weights of 36,000 pounds while the Southern makes the minimum 24,000.

Every classification contains several rules which govern in the transportation of freight, and these vary greatly, e.g., the Western Classification makes an allowance of 500 pounds for racks, standards, strips, supports and blocks, furnished by shippers, on flat or gondola cars. The Official, while making this allowance, provides for an additional allowance of 1,000 pounds for linings in box, ventilated, or refrigerator cars loaded with perishable property. The Southern provides for an allowance of 1,000 pounds for linings, flooring, or dunnage placed in box cars.

be at once appointed to carry on the work. Pursuant to this recommendation, an executive committee of high traffic officials was appointed to have charge of the work of unifying the classifications, and a working committee was formed to undertake the unification with respect to the rules, the description of articles, and the minimum carload weights. As this work must precede the unification of ratings, a uniform classification for the entire country is in the process of development. Thus, instead of each railway having its own classification, all the railways of the country may eventually be operating under one and the same classification.[1]

The matter of classification is one of greatest importance in freight transportation. Such a system is necessary, first, to adjust as equitably as possible the burdens of transportation upon the various articles of traffic.[2] Second, it is essential to tariff making in that it secures simplicity. If separate rates were to be published on each and every one of the from 4,000 to 10,000 items[3] of the present classifications, the number and size of tariffs would be indefinitely multiplied. As it is, 228,490 tariff publications were filed with the Interstate Commerce Commission during the twelve months ending November 30, 1908.[4]

[1] This historical review of the agitation for a uniform Classification is taken from an article by Samuel O. Dunn, entitled *Uniform Classification* appearing in *Railroad Age Gazette*, September 3, 1909, vol. 47, nos. 10, 11, 12, and 13.

[2] Schumacher Milling Co. *v.* C. R. I. & P. R. Co., 4 Inters. Com. Rep. 373, p. 376; 6 I. C. C. Rep. 61, p. 66 (1893).

[3] "The committee of traffic men, which in the spring of 1908 investigated the feasibility of a uniform classification, found that in the Southern classification there were 3,503 L. C. L. [i.e. less than carload] ratings and 773 C. L. [i.e. carload] ratings . . . ; that in the Western classification there were 5,729 L. C. L. ratings and 1,690 C. L. ratings . . . ; and that in the Official classification there were 5,852 L. C. L. ratings and 4,235 C. L. ratings." Samuel O. Dunn, *ibid.*, vol. 47, no. 12, p. 498.

[4] *Twenty-second Annual Report*, p. 14. On this subject the commission has said: "A system of rate-making upon each article without classifying it is said to have proved to be so cumbersome and inconvenient that the arrangement of freight into classes is deemed by roads an essential part of rate-making and is so treated by the Act to Regulate Commerce, which requires that the schedule of charges which every carrier must keep open to the public shall contain the classification in force." Schumacher Mill-

As classification involves the fundamental freight rate structure of the country, any changes made therein have far-reaching effects. By changing a commodity from one class to another millions of rates may be affected and such change may result in damaging, not a single shipper, or a single locality, but an entire industry. By adjustment of classifications carriers can determine such important matters as whether the packing industries shall be located at the Missouri River or at Chicago, or whether flour for export shall be milled at Minneapolis or at the Atlantic Seaboard. Thus "the question of relative rates is often of more importance than that of absolute charges." [1] This suggests one of the most serious problems connected with the classification of freight, namely, the equalization of rival or competing interests. The law requires that rates must be reasonable, which means that the burdens of transportation shall be equitably distributed not only between competing interests, but also between shippers. And again, carriers are entitled to a fair return on their investments. The problems of classification are greatly increased by the fact that the classes must be few, while the articles embraced are almost innumerable and of infinite variety. On account of these great and complicated problems it is impossible to lay down fixed and universal rules. Each case must be analyzed and the classification determined after the entire situation has been examined.

The purpose of this essay is to show what the fundamental principles are which underlie freight classification, and to point out the elements which affect them. In the discussion, the term classification will be taken to mean the entire question of relative rates. It has been thought best to include some elements which may not have a direct bearing on classification proper, but belong rather to commodity rates.

ing Co. *v.* C. R. I. & P. R. Co., 4 Inters. Com. Rep. 373, p. 376; 6 I. C. C. Rep. 61, p. 67.

[1] Noyes, *ibid.*, p. 105.

CHAPTER II

FUNDAMENTAL PRINCIPLES

MUCH has been written concerning the principles on which freight rates should be based. Some hold that the cost of performing the service, with possibly slight modifications, should determine what the freight rate should be. This at once raises the question, what is meant by the cost of the service? Is it the *added* cost of carrying any particular shipment, or is it this cost plus a proportion of all the other expenditures of the railroad, such as the maintenance of way, interest on bonds, taxes, etc. If the latter, how shall these expenditures be apportioned to the several units of freight carried? Shall each unit, as far as it is possible so to determine, bear an equal amount of the charges? This has been found impracticable. Commodities of low value would be prohibited from moving. Concerning this theory the Interstate Commerce Commission has said: "The cost of service, while recognized as an important element in classification and rates, is not alone controlling. On that basis some articles, on account of relation of commercial value to cost of service, though furnishing a large volume of traffic, would not be carried at all, and others of high commercial value would have a very low rate without increasing tonnage." [1]

Many of the advocates of the cost of service theory realize the truth of this criticism, and admit that other factors such as trade conditions, etc., might in some cases be taken into consideration, and, on account of these, greater amounts should be imposed upon some units than upon

[1] Thurber *v.* N. Y. C. & H. R. R. Co., 2 Inters. Com. Rep. 742; 3 I. C. C. Rep. 473 (1890).

others. But as soon as this is conceded, the theory of basing rates on the cost of the service has been abandoned for something else. The supporters of the theory, however, seem to fail to recognize this.

On the other hand, there are those who equally as strongly insist that rates should not be based on the cost of the service, but that the value of the service is the controlling factor. And again one asks, what is the value of transporting any particular shipment or commodity? In this case, also, there are several definitions. To some it is the difference in the cost of producing an article at A and the very highest price which the article will command in the market B. This may or may not be interpreted as allowing any reward to the entrepreneur whose business insight shows him where there is a demand for the goods which he handles. In any case it involves reasoning in a circle. The rate is often the cause, and not the result of the difference in price. To others, value of service, or charging what the traffic will bear, as they call it, means charging not more than the traffic will bear, and thus obviously depends upon various conditions. The commodity may be of such a nature that anything but a low rate will prevent its movement. In such cases the value of the service is low. On the other hand, it may be possible to impose a relatively high rate without diminishing the tonnage offered for transportation which means that the value of the service is great. It will probably be accepted without argument that rates fixed according to such a policy may easily be either too low or too high, for in the one case the revenue received may not be sufficient to cover the added costs for transporting the shipment, and in the other case the rate may be unduly high.

It is seen that both of these expressions, the cost of service and the value of service, are vague, if not misleading, and neither theory alone will supply a working principle. They must be used together. Not only that, the results

so obtained must be further modified by the requirement of the law that a rate must be reasonable.

The costs of railroad transportation may be divided into two classes: (1) the direct, or variable costs, that is those items of cost which represent the extra expenditure to which a rail carrier is put by the transportation of any particular shipment, e.g., extra fuel for power, handling of the freight, etc.; (2) indirect or constant costs, including those expenditures, which do not vary with each shipment but which, within certain limits, remain the same irrespective of the amount of traffic carried, e.g., taxes, interest on bonds, a large share of the cost of maintaining roadbed, etc. While no sharp line can be drawn between direct and indirect costs, it is necessary to examine, in the rough, the relationship existing between these two kinds of cost.

Railroad expenditures, aside from dividend payments, may be divided roughly as follows:[1]

1. Maintenance of Way and Structures	15%
2. Maintenance of Equipment	14%
3. Conducting Transportation	40%
4. General Expense	3%
5. Fixed Charges	28%
Total	100%

The expenditures for maintenance of way and structures are made up of several items.[2] These expenditures vary, partly with the amount of traffic carried, and partly from other influences. Heavy hauling wears on rails, roadbed, bridges and culverts, but half loaded trains wear nearly as much as loaded ones. The elements of nature cause rails to rust, ties to rot, and wash out roadbeds, while bridges and culverts both rust or rot, and become out of date. Repairs and renewals of fences, road crossings, signs, and cattle

[1] See Appendix A.

[2] See Appendix B for these items and the per cent for each.

guards are not in the least affected by the amount of freight hauled. Stations do not wear out, but on account of wind and weather need re-painting and repairing. Docks and wharves are affected by the volume of business, and also by the elements. All wear and tear from the action of the elements goes on irrespective of the amount of traffic carried. While such wear and tear varies according to climate, soil, rainfall, number of bridges, etc., on the whole it may be said that of the total expenditures required for maintenance of way and structures, five eighths represent constant (indirect) and three eighths variable (direct) expenses.[1] As maintenance of way and structures represents fifteen per cent of the total expenditures aside from dividend payments, this makes 9.37 per cent of the expenditures constant and 5.63 per cent variable.

Likewise the items included under the head of maintenance of way[2] are part constant and part variable. Rolling stock generally needs repairs because worn out. These repairs vary largely with the traffic. Cars are, however, worn almost as much by carrying a half as a whole load. Engines deteriorate little more from hauling a heavy load than from a light one. Locomotives and cars are replaced by new ones quite as much because they become antiquated and out-of-date as because they are worn out.[3] On the whole it is probably not unfair to apportion expenditures for maintenance of equipment equally between constant and variable expenses.[4] Maintenance of equipment payments being fourteen per cent of the total payments aside from dividend payments, seven per cent may be called constant costs and seven per cent variable.

Taking up the items which constitute the expenditures for conducting transportation,[2] it is found that station expense, cost of station service and supplies, switchmen,

[1] Noyes, *ibid.*, p. 14.
[2] See Appendix B for items and the per cent for each.
[3] Noyes, *ibid.*, p. 15.
[4] Noyes, *ibid.*, p. 16.

flagmen and watchmen, signalling and similar items are practically constant costs. Such expenses as wages of engineers and roundhouse men, cost of fuel and water, train service and train supplies and items of similar nature are variable, although the expense for a full train does not differ much from that for an empty one.

Roughly speaking, one third of the expense of conducting transportation may be taken as constant.[1] These expenditures being forty per cent of the total aside from dividend payments, there are 26.67 per cent to be added to the variable and 13.33 per cent to the constant expenditures.

The items of general expense[2] are for the service as a whole. They are only slightly affected by changes in traffic and should be considered as constant. The several items included under fixed charges[3] are also constant. These two, i.e., general expenses and fixed charges, amount to three per cent, and twenty-eight per cent respectively.

Summarizing the above gives the following:

Expenditures (aside from dividend payments)	Indirect or Constant	Direct or Variable
1. Maintenance of way and structures	9.37	5.63
2. Maintenance of equipment . . .	7.00	7.00
3. Conducting transportation . . .	13.33	26.67
4. General expense	3.00	
5. Fixed charges	28.00	
Total	60.70	39.30

Thus, approximately sixty per cent of the expenditures analyzed are constant and forty per cent are variable. It must be remembered that these expenditures do not include payments for dividends, reserve funds, etc., and therefore the proportion of an average freight rate, under aver-

[1] Noyes, *ibid.*, p. 17.
[2] See Appendix B for items and the per cent for each.
[3] See Appendix A for items and the per cent for each.

age conditions, that goes to cover variable expenditures is less than forty per cent of the total.[1] This item of variable expenditures represents what might well be termed a *minimum rate* which must be charged on every shipment carried. Other traffic will not be burdened if additional freight is carried at this minimum rate. There are, however, cases in which the rate might properly be even less than this minimum. Such cases will be discussed in a later chapter under the head of indirect traffic.[2]

But the problem is not as simple as might be inferred from the above; average conditions are not the usual thing. The added cost for a particular shipment is not always, in fact is seldom, this something-less-than-forty-per-cent of the total cost. To illustrate, an additional 500 pound box is placed in a car that is not quite full, and which is to go from Chicago to New York. The added cost of carrying this shipment, besides a negligible increase in wear and tear on car and track, is the cost of loading and unloading, which is really nothing because no additional freight handlers are needed on its account and there is probably no additional amount of coal necessary to move the train. But add another box, or possibly a third or a fourth, and then an additional car will be needed. In that case the added cost will be appreciable. It will be the hauling of some 30,000 pounds of dead weight of the car, wear and tear on the car and interest on the money invested in it. Let the number of shipments continue to increase and an additional train will be needed, and if the process continues far enough, double tracking of the road may become necessary, in which event, not only the items included above as belonging to added costs are affected, but also those included as constant expenditures. In each case of marked increase in expense to the carrier,

[1] See Acworth: *The Elements of Railway Economics*, pp. 20–50, for a discussion of this subject in connection with the railways of the United Kingdom.

[2] See pp. 87–89.

some shipment is the last straw that breaks the camel's back. It cannot, however, be said that these respective added shipments are solely responsible for these additional expenses, caused by putting on an additional car, running an additional train, or double tracking the road. These belong just as much to the first shipment received as to the last.

No general rule can be laid down whereby the minimum rate for any particular shipment or class of shipments can be determined. The volume of the new traffic offered, and the degree to which a railroad is taxed to its present capacity, must be considered in determining the added cost. Each and every case must be determined by itself after all conditions are known, and then the added shipment must not be considered by itself but as a part of the total traffic of the railroad, both the actual and the anticipated. The problem is somewhat modified when one considers the fact that most improvements in the transportation service are made in advance for the purpose of taking care of new business as it is offered.

There is another difficulty which is probably more apparent than real, but which should not be passed over entirely. It is found in an argument that is offered against the cost of service theory of making rates, namely, that it is impossible to determine the exact cost of carrying any particular shipment.[1] In the first place it must be remembered that the minimum rate represents only one item of costs, the added, and for that reason the large problems of apportionment of the constant costs are eliminated, thereby

[1] "It will not need any very exhaustive consideration of the question to convince any ordinary reader that the charge against English railway managers, that they profess themselves unable to furnish 'the exact cost of working any particular description of traffic' simply because it does not suit their purpose to give the information, is not so much extremely ungracious as extremely foolish. English railway managers do not furnish the information, for the very sufficient reason that they cannot, and that in the nature of things it is impossible that they should be able to do so." W. M. Acworth. *The Railways and the Traders*, pp. 17 and 18.

greatly reducing the difficulty. Furthermore, most of the traffic carried is able to bear a rate considerably above the added costs. It is hardly inconceivable that an expert railroad cost accountant, by allowing a margin on the safe side, can determine with a sufficient degree of exactness what the minimum rate for any particular commodity should be.[1]

[1] The Railroad Commission of Wisconsin which has given the matter of cost of service particularly careful attention has said the following: "To determine even the approximate cost per unit of transportation to the carriers is very difficult, and can only be done through series of long and complicated calculations, most of which have been explained in former decisions. The first step necessarily involves a separation of the expenses between the different branches of traffic. Complicated as this is, it is yet our judgment that it can be accomplished with a fair degree of accuracy and in a manner that is fair to all concerned. The next step is to separate the expenses on the basis of which the traffic is handled, that is, between the cost of handling the traffic at the terminal and the cost of moving it between the terminals. In this case, as in the case of separating the expenses between the different branches of traffic, many items are met with which are common to both sides, and which do not readily admit of exact distribution. But even these difficulties may be overcome. Upon close and detailed examinations of the various factors involved, some way can usually be found in which the common items can be fairly and equitably assigned. This is not a matter of opinion merely, but has been shown to be so in actual practice. The next step consists of finding some units upon which the various classes of these expenses, or the terminal and the movement costs, can be pro-rated, and the gross and net cost per any given quantity of the traffic be determined. The best units for this purpose would seem to be the loaded car. This must necessarily be so since freight is usually handled and moved in carloads. The terminal costs, for instance, may be pro-rated on the number of these cars and the movement expenses on their mileage.

"When the cost per car in turn for terminal expenses is pro-rated upon the freight in the car the amount of these expenses to each unit of the traffic is obtained. When the cost per loaded car per mile is pro-rated on the weight of both the car and the load the average cost per gross ton per mile of haul is found. This cost per gross ton, or other unit, can be used as the basis upon which the movement expenses per net ton or other unit is computed. Under these methods it is possible to determine the average cost per net unit of traffic of handling the freight at the terminals, as well as of moving it between the terminals. Furthermore, it is possible from the data as a whole to ascertain these costs under various kinds of loading or for lighter as well as for heavier loading.

"The fourth step involves such an adjustment of these costs as to apply to local as well as through business. In these operations, however, the terminal expenses are not involved. It is perfectly clear that these costs have no relation to the length of the haul. They appear to be as great for a carload going a hundred miles as for one going five hundred miles. The movement costs, however, vary with the distance and not far from in the

Thus one fundamental principle, having almost universal application, can be laid down, namely, *every freight rate must be at least sufficiently high to provide an amount of revenue which equals the direct cost of transporting the commodity upon which it applies.* This rate will hereinafter be referred to as the *minimum rate.*

Granting this principle, there remains the question, how shall the indirect costs of a railway, and this item includes a fair return on investment, be apportioned upon the several unit shipments that are carried? This is where the real difficulty in rate-making begins. The problems connected with determining the minimum rate are largely for the accountant to solve. Those relating to the apportionment of the constant expenditures upon the unit shipments carried are vastly greater and of an entirely different nature, involving a consideration of all the industrial and social interests of the country.

same proportion. But the cost of handling way freight which makes frequent stops and slow time is relatively much greater than the cost for through freight or traffic which is moved through from one place to another on faster schedules. To determine the difference in the cost as between through and local traffic, like all other apportionments of expenses, is far from an easy matter, but under a complete analysis of both the expenses and operating conditions it can be done in a manner that would seem to be fair all around.

"In this manner it is possible to obtain approximately correct ideas of the cost per unit to the carrier for handling the traffic. This cost is undoubtedly the most important element in rate-making. This is particularly true since it is possible to ascertain the same for less than carload as well as for carloads, or for both smaller and larger shipments. The value of the products is an element that in importance in this respect is second only to the cost. As already pointed out, articles of high value can fairly bear higher rates than low-priced ones, and in view of this fact it is only just that the charges levied for transportation should be relatively greater in the former case." *In re* Rates on Pulp Wood. Decision no. 89, pp. 57–59.

"Of course, no accountants could devise a pro-rating system that would do all this with absolute accuracy; but a good working approximation, with a slight margin on the safe side, is easily possible. And in accordance with this we have the fact, recognized by the better organized railway systems, that a thorough, detailed and live system of cost-accounting is prerequisite to the intelligent carrying out of the policy of charging what the traffic will bear." John Maurice Clark, *Standards of Reasonableness in Local Freight Discriminations* in *Columbia University Studies in Political Science,* vol. xxxvii, no. 1, p. 39.

The indirect costs may be apportioned in either of two ways: (1) each unit shipment may be made to bear a portion equal to that borne by each and every other unit, or (2) the amount that the various units shall bear may be, broadly speaking, in proportion to their ability to pay. The former method is impracticable because it would make the rate on some cheap commodities so high that they could not be transported. The second method is the one that has been adopted in order to secure the greatest good to carriers, shippers, and society in general.

As this is an extremely important matter in the entire rate problem, it should not be passed over without a careful discussion.

In the first place, it has for generations been the accepted method of determining transportation charges. From the earliest days of turnpikes vehicles have been placed in different categories with different tolls. In so doing the ability of the rich to pay a higher toll was made one of the determining factors. Adam Smith recognized this in saying: "When the toll upon carriages of luxury, post chaises, etc., is made somewhat higher in proportion to their weight than upon carriages of necessary use, such as carts, wagons, etc., the indolence and vanity of the rich is made to contribute in a very easy manner to the relief of the poor by rendering cheaper the transportation of heavy goods to all different parts of the country." [1]

The old canal schedules show that a century ago a consideration of the ability of a commodity to pay a higher or lower charge was taken into consideration in determining the rate. The following is a schedule of the Sheffield Canal, dating from 1815.[2]

[1] *Wealth of Nations*, Book V, p. 326, McCulloch's Edition.
In fact the rich are not made to pay part of the burdens of the poor. See pp. 21–24.

[2] From Acworth, *Elements of Railway Economics*, p. 104.

TONNAGE RATES

	per ton mile
For all coal, coke, charcoal, limestone, ironstone, slag, sand, arusa, sweep-washing waste, stones, slates, cord-wood, cinders, manure, bones for manure, turnips, carrots, and potatoes . . .	2*d.*
For all pig-lead, pig-iron, ballast-iron, nut or bushel-iron, old cast-iron, bricks, old ropes and rags, timber unbroken, bones and hoofs	3*d.*
For all bar, rod or rolled iron or steel, cast-iron goods, deals and other broken timber, lime, onions, apples, pears, peas, beans, rape, line, cole, mustard seed, and all kinds of green groceries that are not by this Act specially charged by name	4*d.*
For all dry groceries, and all kinds of manufactured goods, wares, and merchandise, in casks, hogsheads, or other packages.	5*d.*
For all corn, grain or malt 1*d.* per quarter . . . [= roughly	5*d.*]
For all other goods, matters, and things not specially charged	6*d.*

It is very evident that the cost of handling, e.g., onions, apples, and pears, which took a rate of 4*d.* was not double that of handling turnips, carrots and potatoes, on which the rate was only 2*d.*

When rail transportation came into use, the same principle was introduced into the rate schedules. The following extract from a tariff of the Stockton and Darlington Railroad, effective August 1st, 1830, illustrates the point in question:[1]

Item

1. For all coal and cinders for home consumption	2¼*d.*
4. Stones and gravel for road-making	½*d.*

[1] From *Freight*, December, 1907.

5. For all marl, sand, clay . . . . . 1*d.*
6. For all lime . . . . . 1¾*d.*
9. For all goods, commodities and merchandise not before specified . . . . . 2¼*d.*

Thus, from a historical point of view, it is perfectly right and proper that different kinds of commodities should be made to bear varying amounts of the indirect costs of the transportation company. Still this is not conclusive proof. The fact that a thing has been done for a long time does not necessarily mean that such action is without error.

In addition to the historical argument, it can be urged that a regulated system of distributing the indirect costs upon the various unit shipments according to their ability to pay has been attended with great industrial progress and development. By low east-bound rates on lumber, it has been possible to exploit the forests of Washington and Oregon and to find a market in the Middle States for their products; by means of extremely low west-bound rates on emigrant movables, people of little means have been able to settle the Western Plains so that these, by the aid of further low rates, now feed the nation with their grain and cattle; the same practice has enabled the man living in Iowa to warm his family by the heat from hard coal mined in Pennsylvania. And so on, all over the country hundreds of commodities are carried on rates which do not contribute an average to the constant expenditures of the railways.

The Interstate Commerce Commission[1] has expressed itself on this subject in the following words: "A rule that should measure charges by cost,[2] would work an entire revolution in the business of transportation, since it would no longer be practicable to make articles whose value was great in proportion to bulk or weight aid in transportation

[1] Hereinafter, for the sake of brevity, referred to as the Commission.

[2] By "cost" is here meant that the constant expenditures are apportioned as far as possible in equal amount upon the unit shipments carried.

of articles of different nature, and the carrier would be compelled to demand upon the traffic in heavy and bulky articles, such compensation as in many cases the traffic could not possibly bear. . . . Nothing more disastrous to the commerce of a country could possibly happen than to require the rating for railroad transportation to be fixed exclusively by this one rule." [1]

Unmistakably, abuses have resulted from the practice of apportioning indirect costs in proportion to the ability to pay. These abuses, however, are due to a faulty application of the principle and not to any deficiency in the principle itself. Because of the complexity of the rate problem numerous errors are bound to occur, even though the greatest care is exercised.

The principle of apportioning the indirect costs according to ability to pay is not peculiar to the transportation business. It can be traced through numerous other industries. A very good analogy is that of the packing business. The original purpose of slaughtering houses was to supply meat. The margin between the price of cattle and the price of meat had to be sufficiently large to pay for the cost of killing and packing. These costs included two items, the cost of handling each particular animal *plus* a portion of the "overhead." In the development of the industry it was found that refuse matter could be manufactured into fertilizer, which in the market would bring a price somewhat higher than the added cost resulting from its production. Even though each unit of fertilizer did not pay as much toward overhead charges as each unit of meat did, no injustice was done to the purchasers of meat. On the contrary, they might profit by the production of the fertilizer, because the total overhead expense to be distributed upon the several units of meat was reduced by

[1] *Fourth Annual Report*, pp. 15 and 16. The Commission is mistaken, however, in speaking of articles whose value is great in proportion to bulk or weight *being made to aid in the transportation* of articles of different nature. See pp. 21–24.

the amount contributed by the fertilizer department, thereby enabling the packer to reduce the price of meat. Likewise, other by-products came to be manufactured and each of them bore a part of the indirect costs, decreasing the amount that the original product had to bear, and thereby aiding in its production.

What has been said about the packing business holds also in the case of the petroleum industry and many others. Whenever a by-product can be manufactured, it is an aid to the industry engaged in its production if it contributes even a little to the meeting of indirect costs.

W. M. Acworth brings out an analogy between rail transportation and the production of electricity so convincing that it is well worth quoting in full. "The business of electric supply is usually a monopoly, and in this country [i.e. England] it is more often than not in public hands, yet electric undertakings usually make charges more widely differential than an ordinary railway. A typical charge is *5d.* per unit for electricity used for lighting purposes; *1d.* per unit for electricity used for power purposes. From the commercial standpoint the *5d.* for lighting is fixed as the maximum which competition and other illuminants will permit; the *1d.* is a charge made to induce users of steam power, gas-engines and the like, to adopt electricity as a substitute. As a matter of equity the case is this. The electric undertaking was established primarily to supply light. It involves large capital cost for short-lived machinery and mains. Plant and staff must be capable of dealing with maximum demand, and this demand — 'the peak of the load,' as it is commonly called — only comes for about two hours of the day, and that during the winter months of the year. For twenty hours out of the twenty-four the bulk of the plant is idle; but interest, depreciation, and standing charges are running on all the time. Such service cannot but be expensive to give. There is, however, a way to make it less expensive. If con-

sumers can be induced by the low price of 1*d.* per unit to take electricity for power, they will use it in the day-time, to some extent even in the dead of night, when the machinery would otherwise be idle. The 1*d.* — *ex hypothesis* the highest rate the traffic will bear — will more than cover the extra cost of fuel, and will help to dilute the general expenses of the undertaking. So far from the low differential rate being an injury to, or made at the expense of the consumers of light, the contrary is the case. The standing charges — the great bulk of the whole — instead of being charged on, say, 1,000,000 units, are now spread over 6,000,000, and the cost of supply per unit is proportionally decreased. The increase of the low-charged power customers is the only means by which the lighting customers can hope to see the charges made to them reduced." [1]

And still another analogy might be offered. A manufacturer is selling his output in the domestic market at a fixed price, which nets him a fair return on his investment. The demands of the home market are not sufficient to enable him to run his factory at more than three fourths its capacity. He finds that provided he reduces the price somewhat he can secure a foreign order which will enable him to operate his plant at its full capacity. This reduced price covers all the direct expenses connected with filling the order and leaves a small margin to be applied to the indirect costs of his business. It is good policy for him to accept that order. This is exactly the same principle on which carriers give low rates to cheap commodities to encourage their movement. A low-value commodity which cannot bear the regular rate is to the carrier in exactly the same relation as the foreign order is to the manufacturer. And further, no one can say that the domestic purchaser pays a higher price on his goods so that the foreign order may be filled at a reduced price. The

[1] *Elements of Railway Economics*, p. 93.

domestic purchaser does not only not bear part of the burden of the foreigner, but on the contrary he may be benefited by that sale in that the additional earnings will enable a reduction in the domestic price.

There is, however, quite a difference between the carrier and the manufacturer, but this increases the carrier's justification in making low rates to cause traffic to move. A manufacturing establishment can be shut down at periods when there is insufficient business or, if necessary, the capital can often be turned into other channels. Buildings can be remodeled and used for other purposes. Not so with a railroad. It must be operated continuously, whether doing a large or a small business. Its capital sunk into construction is entirely lost unless it is used for transportation purposes. Preliminary surveys, making of roadbed and sidings, cutting hills, making embankments, building bridges and viaducts, cutting out tunnels and building engine houses are all peculiar to that business alone and cannot be moved to more favorable locations. Even the land on which the road is laid is spoiled for other purposes. Therefore, when a railroad cannot secure freight to pay dividends it must operate to pay fixed charges; when this cannot be done, it must run to pay expenses of maintenance of way and structures, conducting transportation, etc. As long as it can get anything above the added costs it is better for it to operate. If there is a cheap commodity that will not move except at a very low rate, it will be good policy to offer any rate that will enable it to move provided that rate is above the direct costs incurred by its carriage.[1]

[1] "The case of a railroad's estimating the cost of doing a particular piece of business is not unlike that of a lawyer estimating the cost of giving an opinion. He has fitted himself for that particular business, and, as it were, invested his life in the education and experience necessary to transact it. His time is good for nothing else, and if he is not called upon for opinions it will be worthless to him. He can therefore render opinions up to a certain limit almost without cost except for stationery. So a railroad is a large fixed investment capable of furnishing transporta-

The practice of apportioning the indirect costs according to the ability of a commodity to bear a certain rate is not only justified by having been in use for several generations with attendant beneficial results to the country and by having analogies in other industries, it has come to have a legal standing and is also recognized by the Commission. In the case of Minneapolis & St. Louis R. R. Co. *v.* Minnesota[1] Mr. Justice Brown said: "Notwithstanding the evidence of the defendant that if rates upon all merchandise were fixed at the amount imposed by the Commission upon coal in carload lots, the road would not pay its operating expenses, it may well be that the existing rates upon other merchandise, which are not disturbed by the Commission, may be sufficient to earn a large profit to the company, though it may earn little or nothing upon coal in carload lots."

The Commission has said: "Salt requires and gets a commodity rate lower than class rates, and railroads should only be limited as to such lower rating by the rule that a

tion and nothing else. Up to a certain limit it can always take additional business without cost except for a very small amount of fuel. The money it receives for new business above the small *additional cost* is all clear profit. It adds that much to the ability of the road to serve other patrons at low rates." E. P. Alexander, *Railway Practice*. Quoted by Noyes, *ibid.*, p. 40.

"Persons will ordinarily do business only when they see a fair chance of profit, and if press of competition renders a particular trade unprofitable, those engaged in that trade will suspend or reduce their operations, and apply their capital or labor to other uses until a reasonable margin of profit is reached. But capital invested in the construction of a railroad cannot be withdrawn when competition renders the operation of the road unprofitable. A railroad is of no use except for railroad purposes, and if the operation of the road were stopped, the capital invested in its construction would be wholly lost. Hence it is for the interest of the railroad company to operate its road, though the earnings are barely sufficient to pay the operating expenses. The ownership of the road may pass from the shareholders to the bondholders, and be of no profit to the latter, but the struggle for traffic will continue so long as the means of paying operating expenses can be raised." Quoted in the *Final Report* of the Industrial Commission, vol. xix (1902), pp. 358 and 359, from Morawetz, *Treatise upon Corporation Law.*

[1] 186 U. S. 257, 46 L. Ed. 1151, 22 Sup. Ct. 901, affirming 80 Minn. 191, 83 N. W. 60 (1900).

commodity shall not be carried at such unremunerative rates as will impose burdens upon other articles transported to recoup loss incurred in carrying that commodity."[1] And again: "Another element of highest importance, and that cannot be disregarded, is the value of service to the article carried. This is a factor that largely determines the classification and rates the article will bear in the transaction of commerce, and necessarily qualifies the influence of other factors in the distribution of charges with the view to average reasonable revenue."[2]

Thus the principle of apportioning the indirect costs upon the various unit shipments according to their ability to pay is well established historically, practically, by comparison with other industries and by legal decisions.

Having established the principle of unequal (though not necessarily inequitable) apportionment of the indirect costs according to ability to pay, the question arises, how is this apportionment made? Naturally the railways try to do it so as to secure the greatest profits. This at once raises the further question as to what the power of the rate-maker really is. Some railway officials deny the existence of any power on their part. They assert that the apportionment of the indirect costs is governed by economic laws in which they must acquiesce, but which they cannot govern.[3]

This is true for some commodities, but not for others. There is a large class of freight which is, speaking generally, of low value as compared with its bulk, or weight, e.g., coal, lumber, clay, gravel, sand, stone, fertilizer, etc. The rates on all such traffic are beyond question governed by economic laws in which the rate-maker must acquiesce, sometimes even to the extent that he cannot make a rate

[1] Antony Salt Co. *v.* Mo. Pac. R. Co., 4 Inters. Com. Rep. 33 (1892).
[2] Thurber *v.* N. Y. C. & H. R. R. Co., 2 Inters. Com. Rep. 742; 3 I. C. C. Rep. 473 (1890).
[3] See Kirkman, *The Science of Railways*, vol. viii. *Economic Theory of Rates, Private versus Government Control of Railroads*, p. 43.

sufficiently low to induce the traffic to move. On the other hand, there is a class of freight which, speaking generally, has a high value as compared with the bulk, or weight, of which silks may be mentioned as an extreme case. In making rates for the commodities belonging to this class, the rate-maker is, sometimes, practically unrestrained in his power. Between these two extremes are found the large majority of rates over which the rate-maker exercises varying degrees of control.

The following are some of the factors which determine the amount of the rate-maker's power. In the first place, the relation between the price of a commodity and the charges paid for its transportation may affect the power of the rate-maker. If a large portion of the price of a commodity [1] represents freight charges, it may be that an increased freight rate would decrease the demand for that commodity with an accompanying decrease in the tonnage transported, but when only a small portion of the price represents freight charges, the freight rate can be materially increased before there is a sufficient increase in the price of the commodity to reduce the demand for it. For example, the price of anthracite coal at Evanston, Illinois, is $7.75, of which $2.45 represents the charges for transporting the coal from the mine in Pennsylvania. Any increase in the freight rate will at once be noticeable in the Evanston price of the coal and may affect the demand for coal. On the other hand, a silk dress is sold in Chicago for $50. Possibly ten cents, or one fifth of one per cent, of this represents charges for its transportation from New York. It is evident that the rate from New York to Chicago on silk dresses can be increased by a large multiple before the demand is affected.

Another factor is the per cent of the consumer's budget

[1] There are two classes of commodities, those for which no substitute can be found, and those whose use can be replaced by the use of some other commodity. The former class can of course stand a much greater increase in rates, other things remaining the same, than can the latter class.

that is paid out for the commodity under consideration. Many articles of household use, e.g., salt, spices, etc., represent only a small fraction of the annual expenditures of the family. Because such articles as these represent so small a portion of the budget, their prices may be materially increased before a decrease in the demand will result. If, however, the commodity is fuel, for which a large per cent of the annual income is expended, an increase in the freight rate will be by far more noticeable, and the power of the rate-maker is thereby restricted.

The intensity of the need for the commodity is a third factor which affects the power of the rate-maker. If the need for an article is intense, or urgent, the price of that article, and consequently the charge for its transportation, may be greatly increased before a decrease in the demand for the article, with a concomitant decrease in the tonnage transported, takes place. Thus the power of the rate-maker varies directly, other things being equal, as the intensity of the need for the articles for which he is making rates. As the intensity of the need for a commodity may depend upon whether it is a necessity to life or a luxury, or whether some other article can be substituted in its place, these conditions become factors in determining the rate-maker's power.

A final factor to be mentioned is the ability of the consumer to pay. The higher the general economic well-being of a people the higher prices will they pay for the articles they consume and consequently higher freight rates can be charged for the transportation of these articles. Furthermore, if a commodity is sold exclusively to a wealthy class of people, there is a possibility of making freight rates higher. For this reason luxuries are often able to bear higher rates than necessities. The ability of consumers to pay is at times modified by their willingness to expend their wealth. This also affects the rate-maker's power.

Other factors determining the powers of the rate-maker

might be suggested,[1] but the above are sufficient to show that he may exercise considerable power, a power varying according to the nature of the commodities and the conditions under which they are consumed. He were more than human if he did not try to exercise these powers so as to derive therefrom the greatest benefit to himself. Because of this power of the rate-maker abuses have grown up. These abuses have resulted not only from imposing upon some commodities higher rates than they ought to bear, and thereby placing undue burdens upon the consumers of those commodities, but oftener — and this is more serious — from making an unjust difference between the rates on two commodities which are closely related to each other through competition or otherwise, and thus giving one an undue advantage over the other. Because of these abuses it became necessary to place some limitation upon the powers of the rate-maker.[2]

There is another, possibly a greater, reason why some restriction should be placed upon the powers of the rate-maker, namely, the transportation business is essentially a public business, and while the railroad companies are private corporations, they are discharging a public function. Chief Justice Waite, in Munn *v.* Illinois,[3] said, "Com-

[1] Competition is another very important factor which determines the power of the rate-maker, but as a discussion of it is necessary at a later time it has been omitted here. See pp. 65–81.

[2] "That railroad companies would ever require any considerable measure of restraint or control was not at first imagined, for they were regarded as public benefactors. And that there could be anything hostile between their interests and those of the public was not apparent until many years had passed and our railroad system was fairly well developed. When the fact did appear, however, many of the states were not slow to adopt a definite policy of regulation, in which they were followed in 1887 by the Federal Government. The initiation of this policy, then, was not the result of speculations concerning the proper functions of the state, but on the contrary was caused by the appearance of serious abuses in railroad management, and by the realization that they were the inevitable consequence of unrestricted private control." Smalley, *Railroad Rate Control*, p. 4, in *Publications of the American Economic Association. Third Series*, vol. vii, no. 2.

[3] 94 U. S. 130.

mon carriers exercise a sort of public office, and have duties to perform in which the public have an interest," and in another case he said:[1] "Railroad companies are carriers for hire. They are incorporated as such, and given extraordinary powers in order that they may better serve the public in that capacity. They are, therefore, engaged in a public employment affecting the public interest and [are] subject to legislative control as to their rates of fare and freight." And again, in another case it was said that a railroad is not a private work. The service which it performs is public: its rates and its operations are subject to public control.[2]

Furthermore, a railway is a public highway. Justice Harlan in Smyth *v.* Ames[3] said: "A railroad is a public highway, and none the less so because constructed and maintained through the agency of a corporation deriving its existence and powers from the state. Such a corporation was created for public purpose. It performs a function of the state." The Interstate Commerce Commission has said: "The providing of the highways of a nation is an act of sovereignty essential to the existence of the nation. These highways may be provided directly by the Government itself or by private individuals under sanction of the Government. If the duty is delegated to a private individual, that individual, whether person or corporation, is the agent of the Government and acts subject to the well-known laws of agency."[4]

Being public servants and discharging a function of sovereignty, railroad companies have been granted the right of eminent domain. "A fundamental principle of the law of eminent domain is that the power shall be exercised

[1] C. B. & Q. R. Co. *v.* Iowa, 94 U. S. 164.

[2] U. S. Supreme Court decision quoted in City of Spokane, Wash. *v.* Nor. Pac. R. Co., 15 I. C. C. Rep. 377, p. 413 (1909).

[3] 169 U. S. 544.

[4] City of Spokane, Wash. *v.* Nor. Pac. R. Co., 15 I. C. C. Rep. 377, p. 414 (1909). The statement was made after having reviewed several court decisions.

for a public purpose and for a public purpose only." "Railroads, having received the benefit of these important sovereign prerogatives, are forever estopped from denying the public character of their business — a character but for which the use of these powers would have been unlawful." [1]

Since an unlimited power on the part of railway companies to fix rates leads to abuses, and since rail carriers are public servants discharging a function of sovereignty, a federal law has been enacted which regulates interstate commerce. This Act requires that "all charges made for any service rendered or to be rendered in the transportation of passengers or property, . . . or in connection therewith, shall be just and reasonable; and every unjust and unreasonable charge for such service or any part thereof is prohibited and declared to be unlawful." [2] And further: "that it shall be unlawful for any common carrier subject to the provisions of this Act to make or give any undue or unreasonable preference or advantage to any particular person, company, firm, corporation, or locality, or any particular description of traffic, in any respect whatsoever." [3] In providing against unreasonable or unjust advantage the Law does not forbid all discrimination. There is discrimination between commodities which is brought about by conditions affecting the traffic. This is not unjust.[4]

[1] Smalley, *ibid.*, pp. 15 and 16.

[2] Part of Sec. 1 of the Act to Regulate Commerce.

[3] Part of Sec. 2 of the Act to Regulate Commerce.

[4] "The words 'reasonable' and 'just' as used in the Statute, as applied to rates, are each relative terms. They do not mean to imply that the rates upon every railroad engaged in interstate commerce shall be the same or even about the same. The conditions and circumstances of each road surrounding the traffic and which enter into and control the nature and character of the service performed by the carrier in the transportation of the property, such as cost of transportation, which involves volume or lightness of traffic, expense of construction and of operation, competition in some respects of carriers not subject to the Law, rates made by shorter and competing lines to the same point of destination, space occupied by freight, value of freight, and risk of carriage to the carriers, all have to be considered in determining whether a given rate is 'reasonable' and 'just.'" New Orleans Cotton Ex. *v.* Ill. Cent. R. Co., 2 Inters. Com. Rep. 777, 3 I. C. C. Rep. 534 (1890).

From this, then, it is possible to formulate a second fundamental principle governing classification and rates, as follows: *the indirect costs of transportation may be apportioned upon the units of traffic in unequal proportions, taking into consideration the ability of each particular commodity to pay, but in so doing, no undue or unreasonable preference or advantage whatsoever shall be given to any particular party, commodity, or locality.* This is, in fact, the governing principle of freight classification.[1]

It has been found that the terms cost of service and value of service are confusing if not misleading, and that either of the two theories which these represent is insufficient. For this reason the subject was approached from a new point of view, and in so doing the inductive method was used.

All railroad costs, or expenditures, may be divided into direct and indirect costs. An analysis of the five classes of railroad expenditures aside from dividend payments — maintenance of way and structures, maintenance of equipment, conducting transportation, general expense, and fixed charges — showed that, roughly speaking, less than forty per cent of the costs for transportation are direct and more than sixty per cent indirect. These direct costs represent a minimum rate which must be charged on every shipment carried. This minimum rate is, however, only an

[1] "If it be assumed, however, that some valid reasons existed for increased revenues to the defendants, we are nevertheless dealing with a case where the relation of rates as between hay and straw and other commodities is a chief matter for consideration, and this involves the recognized legal duty of the carriers to so classify traffic and fix charges thereon that the burdens of transportation shall be reasonably and justly distributed among the articles they carry." Page *v.* Delaware, L. & W. R. Co., 6 I. C. C. Rep. 548, 4 Inters. Com. Rep. 525; Meyer *v.* Cleveland, C. C. & St. L. Ry. Co., 9 I. C. C. Rep. 78. "That is the governing principle of a freight classification, and it arises under the obligation imposed upon carriers by the statute not to charge unreasonable and unjust rates, or impose any unjust discrimination or undue prejudice in any respect whatsoever." The National Hay Ass'n *v.* L. S. & M. S. R. Co., 9 I. C. C. Rep. 264, p. 304 (1902).

average rate for average conditions, and these average conditions seldom occur. The direct costs for a particular additional shipment may vary from a negligible quantity to an amount far in excess of the revenue received for the transportation of that shipment. For this reason, it is impossible to lay down any general rule for the determination of the minimum rate for any particular shipment or class of shipments. Each and every case must be treated by itself, taking into consideration all the conditions affecting the traffic of the railway in question. While difficulties are encountered in determining the minimum rate, because of the great complexity of the problem, an expert railroad cost accountant, by allowing a margin on the safe side, should be able to determine with a sufficient degree of exactness what the minimum rate for any particular commodity should be. From this minimum rate is derived the first fundamental principle of freight classification, namely, that every freight rate must at least be sufficiently high to provide an amount of revenue which equals the direct costs of transporting the commodity upon which such rate applies.

In considering the indirect costs it was found that these should be apportioned upon the different unit shipments according to their ability to pay. This principle has been recognized in practice from the earliest days of transportation over turnpikes and by canal and by rail carriers. Experience has shown that such a system of apportionment of indirect costs, when properly regulated, has been attended with great industrial and economic progress and development. The condition is not peculiar to the transportation business. Analogies can be found in all industries engaged in joint production, be this production of different kinds of commodities, the same commodity for different uses, or the same commodity for different markets. Surely, the principle is fully justified.

It was shown that in making rates for some commodities,

usually those of low value as compared with their weight, the traffic manager may act under restraint caused by economic laws which he cannot govern, while in making rates on other commodities, which are of greater value as compared with their weight, he may be, for practical purposes, unlimited in the exercise of his powers. A misuse of their powers on the part of carriers has resulted in serious abuses. These abuses have shown the necessity of some sort of regulation of the rate-making powers.

In addition to the need for regulation caused by abuses, such regulation is justified by the fact that rail carriers are public servants and discharge a function of sovereignty in operating public highways. On account of performing this public function, they have been given the right of eminent domain and, in accepting this right, have been estopped from denying the public nature of their business.

Because of the need of regulation, and the above justification for it, a federal law has been passed providing that rates must be reasonable and just.

Therefore, a second fundamental principle of freight classification was formulated, namely, the indirect costs of transportation may be apportioned upon the units of traffic in unequal proportions, taking into consideration the ability of each particular commodity to pay, but in so doing, no undue or unreasonable preference or advantage whatsoever shall be given to any particular party, commodity or locality. This becomes the governing principle of freight classification.

CHAPTER III

ELEMENTS DETERMINING RELATIVE MINIMUM RATES

In considering the elements that determine relative minimum rates, it will be remembered that the expression "minimum rate" is here used as an equivalent to the direct costs of transportation. In discussing these direct costs there are several important elements which need to be considered. These elements, however, are not of equal importance and, furthermore, any one of them may in one case be very important, while in some other it may be a negligible item. In this connection, as throughout the entire rate problem, each case must be taken up for individual consideration.

A very important element in determining the direct costs is dead weight, that is, all weight hauled on which no revenue is, or at least should be, earned. There are two kinds of this dead weight: (1) that which is separate from the shipment and on which no freight charges are paid, and (2) that which is a part of the shipment itself and on which the same rate is charged as on the commodity which it accompanies. That which is separate from the shipment will be discussed first. It is found to take several different forms, as, weight of cars, preservatives, dunnage, etc.

By far the largest item of dead weight is the weight of the car in or on which the freight is carried. Different commodities require different kinds of cars: fresh fruits, packing-house products, etc., require refrigerator cars; live stock, palace stock cars; coal, gondola cars; and logs, flat cars. These various styles of cars vary in weight, an ordinary box car weighing about 30,000, a refrigerator car

40,000, a stock or tank car 32,000, and a flat car 26,000 pounds.[1] For this reason the amount of dead weight carried for each unit weight of freight may differ. Again, some of these cars can be used only for the transportation of the particular commodity for which they were designed, while others can be used for only a limited number of articles, as, for example, a tank car can carry only liquids, and often only a single kind; stock cars, being open and containing noxious odors, cannot be loaded with freight which is subject to damage by weather or odor, and the necessity of keeping refrigerator cars clean prohibits the loading of many commodities into them. For these reasons a large per cent of this special equipment is returned empty to the shipping point, and whenever that occurs the per cent which is so returned is dead weight chargeable to the outbound shipment.

Even though special equipment is returned loaded to its full capacity with ordinary freight, there still remains an item to be taken into consideration. If a refrigerator car weighing 40,000 pounds is loaded on a return trip with freight which would ordinarily be loaded into a box car weighing 30,000 pounds, the 10,000 pounds difference in weight of the two cars is an item of dead weight belonging to the outbound shipment that was carried in the refrigerator car.

The next largest item of dead weight is made up of preservatives, such as ice placed in the bunkers of refrigerator cars, salt, etc. Usually a fixed amount, from 3,000 to 12,000 pounds,[2] is carried free. Sometimes, however, shippers are compelled to pay full rate on preservatives, and then they should reduce the rate instead of add to it as will be explained later. Then, again, allowances amounting to from 500 to 1,000 pounds are made for stakes, blocks, braces, etc., used to keep freight from shifting, also for extra linings

[1] For a full list of average weights, see Appendix C.

[2] Georgia Peach Growers Ass'n *v.* A. C. L. R. Co., 10 I. C. C. Rep. 255, p. 261.

in cars and other like items. These are called dunnage allowances, and the amount of weight thus allowed is dead weight. Likewise allowances are made for bedding and manure in stock cars.

The manner in which this dead weight, or non-paying freight, as it is erroneously called, is usually taken into account by carriers is not free from criticism. The following case,[1] in which the purpose was to establish relative rates on fresh and dressed meats and on cattle between Kansas City and Chicago, is a typical one and shows the method employed. It was done by comparing the revenue per 100 pounds of the gross weight determined as follows:

FRESH AND DRESSED MEATS

Car	36,000 lbs.
Revenue-paying load	21,000
Ice and other preservatives	4,000
Car on return trip	36,000
Total	97,000
Revenue on 21,000 pounds at 20¢ per 100 lbs.	$42.00
Less mileage from and to point of shipment	10.00
Net revenue	$32.00

Revenue per 100 pounds on total weight hauled about 3.3 cents.

CATTLE

Car	26,500 lbs.
Revenue-paying load	22,000
Bedding, manure, etc.	2,000
Car on return trip	26,500
Total	77,000
Revenue on 22,000 pounds at 20¢ per 100 lbs.	$44.00
Less mileage from and to point of shipment	6.00
Net revenue	$38.00

Revenue per 100 pounds on total weight hauled a little over 4.9 cents.

[1] From Chicago Live Stock Exchange *v.* C. Gt. W. R. Co., 10 I. C. C.

These rates per 100 pounds on the gross weight were compared. The fallacy of this is that it fails to discriminate between the dead weight, including weight of car, ice, bedding, etc., and the freight. They are in no wise the same. The transportation of the meat and the cattle is a service rendered to the shipper in particular and to society in general. In other words, place utility is created when 100 pounds of either of these commodities are transported from Kansas City to Chicago. On the other hand, the hauling of the car to Chicago and then back to Kansas City, as well as hauling the ice, etc., is not, as such, a service to the shipper and to society because no place utility is created thereby. It is merely an item of the direct costs connected with the transportation of the meat and cattle. As place utility is created only in the case of the meat and cattle the weight of these, and these only, should be taken into account in the distribution of the indirect expenditures of the railroad upon the unit shipments carried. It is clear that by the method used above, that is, finding a rate per 100 pounds on the total weight, both freight and dead weight, the dead weight is considered exactly the same as the freight, and an equal amount of indirect costs is assessed upon each and every unit of dead weight hauled as is assessed upon each and every unit of freight. The carrier's rate upon the meat and upon the cattle, which in both cases was 20 cents per 100 pounds, represented the cost of the transportation, including a fair return on investment. This rate of 20 cents is made up, as was shown in the preceding chapter, of two items, the direct costs and the indirect costs, the latter including the return upon investment. The larger item of indirect costs, provided, however, that there are no elements of reasonableness to be taken into consideration, remains the same for both commodities. It is only the item of direct costs that is affected by the dead weight, and not

Rep. 428, p. 439 (1905). Many other similar cases are to be found in the I. C. C. Reports.

all of that, for it does not cost much more to switch the 97,000 pounds gross weight than the 77,000 pounds because very often switch engines do not pull their maximum load. When they do not do this, there is no additional expense incurred. There is also no direct cost for maintenance of terminal facilities because of the extra dead weight. In fact, the only part of the direct costs which are materially affected are those connected with the movement of the freight from the one terminal to the other.

Thus, the element of dead weight is by far not as significant an item as it has been considered. It affects only a comparatively small part of the cost and not the entire cost, as is the popularly accepted idea. The fact that dead weight affects low rates to a greater extent than high rates is, however, apparent because direct costs represent a larger part of the low rate than of the high one. Hence, the element of dead weight increases in importance as the rate is lowered. This should not be overlooked.

Taking up the discussion of that class of dead weight which forms a part of the shipment itself, it is found to include such items as crates, boxes, barrels, cases, etc., which are required for the safe carriage of some freight. All so called "carriers," [1] both as a part of a shipment and when returned empty, as well as all preservatives, and dunnage for which no allowance in weight is made, are dead weight.

In considering this class of dead weight, it must be remembered that the carriage of it is not a transportation service which has value to the shipper in the same sense as the carriage of the freight. The dead weight would not be carried were it not necessary for the safe transportation of the freight which it accompanies. Some kinds of traffic do not require any dead weight, while other kinds require very much. Lumber, bricks, iron, etc., may be mentioned as illustrations of the former, while a buggy, whose gross

[1] Almost everything in which freight is carried as, egg cases, butter tubs, iron drums, bottles, bags, barrels, carboys, boxes, milk cans, and a long list of other articles are called carriers.

weight when ready for shipment is one fifth dead weight in the form of a crate, is an illustration of the latter. In making rates on freight which is partly dead weight, it seems only reasonable that account should be taken of this dead weight in such a way that it will not be made to contribute to the indirect costs of the railroad. When empty carriers are returned, rates should cover direct cost only, for they have the same relation to the goods shipped out in them that a special kind of car returned empty has to the goods it has carried.

The evils resulting from a failure to recognize this element are forcibly illustrated by the following:[1] sixty barrels of oil make a carload shipment of 24,000 pounds, of which 3,900 pounds is the tare weight of the barrels and 20,100 pounds the net weight of the oil. The 20,100 pounds represent the transportation service that is of value to the shipper. A competing producer shipped 24,000 pounds of oil in a tank car, and paid the same total charges as the first shipper did. From the point of view of the value of the service to the shipper, this meant that if the adjustment of rates is reasonable, the value to the first party of transporting 500 pounds is as great as of 600 to the second. The injustice is further augmented by the fact that the tank car shipper had the dead weight, that is, the empty car, returned free, while the barrel shipper paid for the return of his dead weight. To bring about full justice, the weight of the barrels and the box car in the one case and the weight of the tank car in the other, for both the outbound shipment and the return haul, should have been considered as dead weight, and the cost of its movement should have in each case been apportioned upon the unit shipments of oil. This was not done. Is it any wonder that the oil business has become monopolized when as important an element as this has been unrecognized in making the freight

[1] From Rice, Robinson & Winthrop *v.* W. N. Y. & P. R. Co., 3 Inters. Com. Rep. 162, p. 164; 4 I. C. C. Rep. 149 (1890).

rates on the products of that industry? While a failure to recognize this element does not lead to as disastrous results when unlike traffic is considered, the injustice to the freight requiring dead weight still remains, and it is in reality made to bear part of the burdens of traffic which does not require dead weight.

Car capacity is a second element of direct costs, and refers to the amount of weight that can be loaded into a car. It is one of the most important elements of direct cost. In fact "in determining what rates are reasonable for carriage of various commodities, no one thing has been oftener or more earnestly insisted upon by the carriers as a controlling element than car capacity."[1] The element becomes of greater importance every year. About two decades ago most cars had capacities of from 20,000 to 24,000 pounds, while to-day 80,000 is not uncommon, and cars having 100,000 pounds capacity are to be found. It is also of very great importance in determining carload and less than carload differentials. For these reasons it is well to devote special attention to this element.

Car capacity is a special form of the element of dead weight and affects cost in that the amount of dead weight, which in this case is the weight of the car, hauled per unit of freight carried varies inversely and in the same proportion as the total weight loaded. Being a special form of dead weight, it is subject to the error in application noted above. The following is a typical case showing the method by which reduction of cost by car capacity is figured. "An ordinary box car weighs perhaps 36,000 pounds. The total weight of that car loaded with square bale cotton would be 61,000 pounds and the carrier would receive, at a rate of 30 cents per hundred pounds, $75 for the service, or about 12.3 cents per hundred pounds for the

[1] Commissioner Prouty in Planters Compress Co. *v.* C. C. C. & St. L. R. Co., 11 I. C. C. Rep. 382, p. 412 (1905).

gross weight of car and contents. If this same car were loaded with round bale cotton, it would weigh, car and contents, 86,000 pounds. At a rate of 20 cents per 100 pounds the total revenue would be $100, or about 11.6 cents per 100 pounds for the gross weight carried. When it is remembered, therefore, that the car in one case earns $100, while in the other it earns $75, it must be evident that cotton compressed to a density which permits loading of 50,000 pounds to the car is as good business, looking only to the cost of carriage, at 20 cents per hundred pounds, as is cotton which will only load 25,000 to the car at 30 cents per hundred." [1] According to this, as is also said later in the argument, loading 50,000 instead of 25,000 pounds of cotton to the car saves one third of the cost.[2] This case is chosen because every element but car capacity is eliminated.

By putting this in another form it will be easier to analyze. If 50,000 pounds are loaded into two box cars, each weighing 36,000 pounds, the gross weight is 122,000 pounds. If loaded into one car it is 86,000, and the hauling of 36,000 pounds, or 29.5 per cent, is saved. This seems, on hasty analysis, to be a saving of nearly one third in cost. Such is not the case, however. What cost is it that is reduced? Not the entire cost, but merely that of hauling from one

[1] Commissioner Prouty dissenting in Planters Compress Co. *v.* C. C. C. & St. L. R. Co., 11 I. C. C. Rep. 382, p. 412 (1905). Exactly the same line of argument is used by carriers, especially when they wish to show that the cost of hauling light and bulky articles is greatly in excess of that of hauling commodities of great density. Business Men's League of St. Louis *v.* A. T. & S. Fe R. Co., 9 I. C. C. Rep. 318 (1902) and Thurber *v.* N. Y. C. & H. R. R. Co., 2 Inters. Com. Rep. 742; 3 I. C. C. Rep. 473 (1890) are two very important cases in which the same method was used by carriers and approved by the Commission. Numerous other cases are to be found.

[2] Note also the following from the same case: "It has not only been given as a matter of opinion by traffic experts without number, but has been demonstrated by mathematical computation that the cost of the service varies almost exactly with the ability to secure a heavy car loading. This Commission in its opinions has repeatedly recognized the substantial accuracy of this position. That it must be so is obvious from the most superficial consideration of the case before us."

station to another, including wear on track, and interest on a small amount of capital invested in equipment. This cost does not even cover all the items which in the preceding chapter were included under variable costs and must therefore, under average conditions, be considerably less than forty per cent of the total cost. Thus the saving will probably approximate ten per cent instead of one third, provided, however, that each unit shipment bears an average portion of the indirect costs.[1]

The error in the application of this element probably comes from the fact that the cost of hauling is so closely associated with each shipment, while the other costs are not so apparent.

The evils arising from the use of this element in the way cited are very significant. It leads to a great difference between rates on light and bulky articles and on those that are very heavy and compact. In practice, this difference seems to be much greater than any possible difference in the actual cost of handling. This means that light and bulky freight contributes to constant costs larger amounts per unit carried than does heavy freight. This is surely unjust.

Again, as car capacity is one of the most important elements in determining the difference in the cost of handling carload and less than carload shipments, these differentials may become too great and cause undue prejudice in favor of the large shipper. That this is true is seen from the following: "The loading of carloads is very much heavier than the less than carload, from which it results, first, that less non-paying weight is hauled in carload traffic, and second, that the car is more nearly used to its capacity. A freight car weighs approximately twelve tons. If that car be loaded with six tons of freight, its movement in-

[1] The importance of the element car capacity, as has been shown to be true of dead weight, depends upon whether it is applied to low rates which are only slightly above the minimum or to high rates which contribute a large proportion to indirect costs.

volves the handling of eighteen tons, of which but six are paying freight, while if the car were loaded with sixteen tons there would be a movement of twenty-eight tons, of which sixteen tons are paying freight. Assuming that the average load of less than carload business is six tons, and the average load of carload business sixteen tons, and that the cost of handling per ton is the same in both cases, a rate of $1.00 on carload would be about equivalent to $1.75 upon less than carload. But the car mileage is the same in both cases, and the cost of movement does not increase in proportion as the weight increases, so that upon this basis of loading there would actually be a greater difference in the cost of service." [1] What has been said concerning the difference in the rates on cotton, when loaded 25,000 and 50,000 pounds to the car, is equally true in this case. And still, in this particular connection the evil becomes greatly augmented, for generally speaking it is the small shipper who pays the less than carload rate and the large shipper who pays the carload. Thus the weak are made to bear heavy burdens which rightly belong to the strong.

The amount, in terms of weight, that can be loaded into a car differs greatly with the nature of the commodity and its preparation for shipment, and is determined by the following items: (1) density, (2) bulk, (3) whether carload or less than carload lots, (4) waste space, (5) expense of loading, and (6) commercial conditions.

Density means the weight per unit volume, and therefore the greater the density, the greater is the weight that can be loaded into a car. In other words, car capacity varies directly and in the same ratio as the density. Different commodities have different densities. The weight

[1] Business Men's League of St. Louis Case, 9 I. C. C. Rep. 318, p. 354. This case and the Thurber Case, 2 Inters. Com. Rep. 742; 3 I. C. C. Rep. 473, in which the same method was used, are the two most important cases on the matter of carload and less than carload differentials that the Commission has been called upon to decide.

of a bushel or of a cubic foot of oats is less than that of the same volume of wheat. The density of some commodities varies according to the preparation for shipment that they have passed through. Thus, uncompressed cotton has a weight of twelve and one half pounds, the common square bale of twenty-three, and the round bale of from forty-five to forty-seven pounds[1] per cubic foot. Some commodities not subject to compression vary on account of their condition, as wet lumber has a greater density than dry.

Different densities of the same commodity are not recognized when the difference is not very great. Commodities which are subject to compression, when the requirement for compression causes no hardship, receive lower rates when in the compressed state than when in the uncompressed. Varying degrees of density of the same commodity, if the differences are marked, may or may not cause different rates according to circumstances, but the density should be one of the factors to be taken into account.[2]

[1] Planters Compress Co. *v.* C. C. C. & St. L. R. Co., 11 I. C. C. Rep. 382 (1905).

[2] The Commission has recognized that a commodity in compressed form is entitled to a lower rate than if uncompressed. Speaking of the "plantation," or uncompressed bale and of the "square," or compressed bale, it said: "Nor can the rail carriers transport cotton to far distant markets or ports upon any schedule of rates which the shipper could afford to pay unless it is compressed at the point of origin of the freight or in transit. It is therefore a necessary preparation of cotton for a long haul. When thus prepared the carriers may justly and reasonably make a considerably lower rate on compressed than on uncompressed cotton."

"The conclusion we have reached is that the rail carriers . . . for the present, find no better or fairer rule than that the difference in the rate between compressed and uncompressed cotton should be the actual and necessary cost of compression." New Orleans Cotton Exchange *v.* Ill. Cent. R. Co., 2 Inters. Com. Rep. 777; 3 I. C. C. Rep. 534.

It should be noticed, however, that the Commission, while recognizing the saving by compressing the cotton, ordered the differential between the rates on the two densities to be fixed, not on an estimate of the saving caused, but on the basis of the exact cost of compression, and thus the difference in the densities, which was as one to two permitted the difference in rates rather than required it. Furthermore, the differential was the same without regard to what the rates were or the distance carried. Hence this can hardly be considered as a recognition of the saving caused by the increased density, for it was the same to the shipper whether he paid the higher rate, or the lower rate and the cost of compression.

The term bulk is correlative with density and differs from it in that it refers more especially to the space occupied in the car than to the weight per unit volume. One would say that stove pipe elbows are bulky, but hardly that they have a low density. The bulk of an article is often determined by the manner in which it is put up for shipment. A chair may be wrapped as it is, that is "set up," or the legs and seat may be separated and tied into a bundle. This latter is technically called "knocked down." Tin pans can be placed the one inside of the other and when thus packed are "nested." Cots with the legs folded down and securely tied are said to be "folded." By these various methods bulk is reduced, and classifications rightly recognize this when they provide lower rates for an article if knocked down, nested, or folded than when set up.[1]

The capacity of a car may depend upon whether it is loaded with a single commodity, or with a lot of miscellaneous less than carload shipments. The loading of the less than carload freight is much below that of the straight carload, sometimes as much as six to sixteen[2] or as seven to

Later the Commission refused to grant a lower rate on cotton compressed to a density which permitted a loading of 50,000 pounds to a car than on that which could be loaded only 25,000. The following language was used: "To separate different grades or densities of the same article into different classes with varying rates, even if it could be accomplished, would go far to defeat the real purpose of classification." Planters Compress Co. *v.* C. C. C. & St. L. R. Co., 11 I. C. C. Rep. 382, p. 383. In this case Commissioner Prouty dissented. Quotations have already been made from what he said. The Commission seemed to believe that by ordering a low rate on cotton with a great density, the compressing business might become monopolized by the owners of a particular process. Had this factor, though from the evidence it hardly seemed probable that monopoly would follow, not entered in, the decision might have been otherwise.

It is clear that density is of greater importance to water carriers than to rail carriers because they have no road to keep up and earn interest on, making direct costs greater as compared with indirect costs.

[1] In Western Classification No. 47 chairs set up are one and one half times first, and knocked down second class; tinware in boxes, first class; in boxes nested solid, third class, etc.

[2] Thurber *v.* N. Y. C. & H. R. R. Co., 2 Inters. Com. Rep. 742; 3 I. C. C. Rep. 473 (1890).

fourteen.[1] This is true for three reasons: (1) it is impossible to load miscellaneous freight as compactly as a single commodity; (2) there is often a lack of sufficient freight to fill a car at stated intervals, and (3) way freight, for which the train is stopped at every small station along the road to load and unload, must be placed in the car so that it is easily accessible.

Car capacity is often reduced on account of necessary waste of space. Packages of large dimensions or of odd shapes cannot be loaded to advantage, as, for example, an uncrated automobile. If melons are loaded more than a few layers in depth, the weight of the top layers will crush those underneath, and it is also claimed that peaches which are shipped in refrigerator cars cannot be loaded above four tiers because the air above that level is warm, causing the peaches to rot. Then again, the cost of loading may be greater if the car is loaded to its full capacity than if it is not, as in the case of cotton which is usually loaded to but 25,000 pounds when by a more expensive method of loading this can be increased to 50,000. As long as there is no difference in the rate shippers will naturally load by the cheapest methods.

A loading below the full car capacity is very often brought about by commercial conditions. This is well illustrated by the cannel coal business. This coal is worthless for steam purposes, but being clean to handle, easily ignited, and burning with a clear flame, it is especially adapted for use in grates, to which use it is mainly confined. For this reason the demand for it is in small quantities and, even though its density is about the same as that of ordinary bituminous coal, cars are seldom loaded to their full capacity.

The practice of loading cars below their full capacity, whatever the reason may be, is a proper condition to be taken into account by carriers in fixing rates.

[1] Business Men's League of St. Louis *v.* A. T. & S. Fe R. Co., 9 I. C. C. Rep. 318 (1902).

Movement of traffic, a third element in determining the minimum rate, refers to (1) the direction of movement, (2) to the question of solid trains, and (3) to regularity of the traffic. Its relation to the direct costs will be shown in connection with each item.

The direction in which particular traffic moves may affect the cost, for if a commodity moves in large aggregate volume in one general direction across the country, it is very probable that there will be a considerable movement of empty cars in the opposite direction. These empty cars must then be treated as dead weight. The same is true if the distribution of a commodity results in a large outbound traffic in all directions and an inbound movement of empty cars.

Commodities, like grain, cotton, live stock, etc., which move in vast quantities in the same direction can very often be hauled in solid trains and the saving caused thereby may rightly be recognized in determining classification. This item is, however, of only relatively slight importance for it cannot be applied very often.

Irregularity increases cost in all industries, — in the production of transportation service as truly as in other industries. Carriers must provide equipment for traffic which may be offered at periods when the demands for transportation are the greatest. This causes idleness of cars when the stress of business is not so great. Employees whose efficiency depends upon a general knowledge of the road must be retained at all times. Those commodities which furnish a steady tonnage throughout the year reduce this waste from idleness of men and equipment to a minimum.

The movement of many commodities is seasonal. During the season shipments can be counted on with certainty, but when the season is gone there is no movement whatever. The seasonal movement of one commodity may, however, at least to some extent, be offset by the movement of

some other during the off season, or by means of the present system of interchange of cars between the carriers, equipment can be transferred to some other section of the country where needed. Idleness of roadway, etc., during certain seasons of the year should not necessarily be charged against a commodity which has a seasonal movement, for as far as roadway is concerned it makes little difference whether a very large tonnage is carried over a road during six months or whether the same tonnage is spread out over an entire year. The seasonal nature of the movement of a commodity also very often affects cost in that it causes a movement of a large number of empty cars in the opposite direction. Some commodities have not only a seasonal movement, but also a very uncertain movement. Thus the peach crop is not the same from year to year and the strawberry crop is even more uncertain, for a few days of unfavorable weather just before the season opens, and after equipment has been provided, may destroy the entire crop, resulting in a total loss of all preparations. On the principle that added risk warrants larger profits, the rates on such commodities must be relatively high.

Other articles, those which may be termed luxuries, contribute steady tonnage during times of prosperity, but fall off in their movement with every industrial crisis. The uncertainty of continuous movement at a time when most needed should properly be considered.

A fourth element of direct costs is the risk assumed by the carrier for loss or damage. An ocean shipment is insured against loss or damage and a regular premium is paid. When that shipment is carried by rail, the carrier acts in the capacity of insurance company and the premium is included as a part of the rate. It makes little difference how the matter is handled, in either case it is an item of direct cost connected with the carriage of the goods.

The causes which bring about damage to goods while in

transit are numerous. Through the carelessness of freight handlers, and otherwise, goods may be damaged in loading or in unloading, and hard bumping of cars in switching makes loads shift, thereby rubbing the freight. Wrecks and collisions, while comparatively few, cause much damage when they do occur. Exposure to rain or contact with other goods in the same car may result in injury, while perishable goods, when subject to excessive delays in transit, deteriorate or rot. Total loss is only rarely caused by loading goods into the wrong car, but more often by being stolen. Hats, which are ready to wear, or cigars, nuts, etc., which can be consumed, are subject to the latter.

Damage takes several different forms: chinaware is broken, bristles of toilet brushes become discolored, bronzed articles tarnish, a buggy top is torn, dry goods are damaged by water, perishables rot, while liquids, by leaking, are wasted and often damage other goods. The extent of the damage varies greatly with different kinds of freight. Some commodities, as pig iron, lumber, etc., are not subject to damage, others only slightly so, while still others are very apt to be damaged. Injury to leather scraps is confined to the pieces actually damaged, but a small spot on a hat ruins it entirely. Solids can often be gathered up when that which contains them is broken, not so with liquids. An explosion of dynamite not only entirely destroys it, but also everything else near by, including the car. This liability to loss or damage and the extent thereof determines the amount of risk that the carrier takes. The value of those commodities which are subject to damage influences the amount of risk taken, but the value of an article is only of slight importance in this connection.

Because of the great variety of freight loaded together, the risk of handling less than carload freight is much greater than that in connection with the full carload shipments. Miscellaneous articles cannot be packed as compactly and as firmly as a full car of one kind, and an article

is not nearly as apt to be injured by contact with another of its own kind as with one of a different kind.

The amount of risk that carriers take in transporting goods is subject to limitation in two ways: (1) by limiting the liability, and (2) by requiring that goods be packed in certain ways and in certain styles of packages. The liability of the carriers is limited principally by the conditions of the uniform bill of lading, which release the carriers from damage caused by "the act of God," [1] a public enemy, quarantine, the authority of the law, and several other miscellaneous conditions.[2] When goods are shipped "not subject to the uniform bill of lading," rates are ten per cent higher than otherwise.[3] By stipulating a released value [4] on a shipment, the amount of risk taken is limited. Thus household goods are limited to a valuation of $5 per 100 pounds.[5] The second method of limiting risk is to regulate the method of packing freight. Some articles are better protected by a solid box than by a mere crate. Likewise a wooden head in a barrel gives more security than a cloth covering, which is liable to come off, and the risk of carrying goods in cloth sacks is less than when in paper sacks. For these reasons classifications distinguish between different forms of packages by giving them different ratings.

[1] Storms, lightning, floods, earthquakes, etc.

[2] See any bill of lading printed by a carrier for these rules in detail.

[3] Western Classification No. 49, Rule 4-D, page 1.
Official Classification No. 37, Rule 1, page 1.
The Southern Classification, which provides for use of carrier's bills of lading instead of the uniform bill of lading, adds twenty per cent to the rates when shippers elect to have goods forwarded at carriers' liability. No. 37, Rule 1, page 1.

[4] That is, a maximum price that the carrier will pay in case of loss or damage.

[5] Speaking of emigrant movables, "defendants say that one purpose of this provision for limitation of their liability in case of loss or damage was the protection of the carriers against overvaluation of property lost or injured, in cases where the carrier has not, and cannot obtain knowledge or information as to the real value of the property and is placed at the mercy of shippers in this respect." Duncan *v.* A. T. & S. Fe R. Co., 6 I. C. C. Rep. 85.

Judging from the emphasis which traffic managers put upon the element of risk, one is led to believe that it is among the most important. Exact figures, when available, are always the best evidence. The average, for five years, of all payments for loss and damage was about nine tenths of one per cent of all railroad expenditures.[1] The relative amount of loss and damage from freight traffic is greater than for the passenger, which will increase the percentage somewhat, but part of this is offset by the fact that the rate, on which comparison is made, covers more than the expenditures. It seems safe to say that the average amount which is required to cover risk from loss or damage is about one and one fourth per cent of the rate. Many commodities which have a large tonnage are not subject to this element, or only slightly so, as, for example, pig iron, coal, lumber, grain, etc., and therefore the risk on the more easily damaged goods must be considerably above the average, and in special cases it becomes of great importance. Altogether, however, it develops "in most cases that the element of risk arising from injury to or loss of property is practically a negligible quantity."[2]

A fifth element affecting the minimum rate is the handling at terminals and at transfer stations. This element is of greater importance in determining the difference between carload and less than carload rates upon the same commodity than in any other connection, though it has a slight influence in determining the relative rates on different kinds of traffic when shipped in carload lots.

Considering this for the purpose of making carload and less than carload rates, it is found that in the case of full carloads the owner of the freight loads and unloads it,

[1] Appendix B shows that loss and damage is 1.233 per cent of operating expenditures, which as shown in Appendix A are 72.17 per cent of the total expenditures. Therefore the item is 0.89 per cent of the total.

[2] Van Camp Burial Vault Co. *v.* C. I. & L. R. Co., 12 I. C. C. Rep. 79 (1907).

while the less than carload shipments are loaded and unloaded by the carriers. Furthermore, less than carload shipments must be unloaded, transferred, and then reloaded at transfer stations, while the full carload is easily switched over to the connecting line. Office work is also greatly increased by the less than carload freight, because instead of a single billing for the straight carload, there may be fifty bills, or even more, for the car of less than carload freight. Freight houses must be provided for less than carload freight, but this expense is at least partly offset by the allowance of forty-eight hours for unloading and forty-eight hours more for loading carload freight, and by the cost of switching cars to and from the shipper's loading platform.[1]

In considering the differences between less than carload rates on different commodities it is found that it costs more to load and unload some articles than others. The element is, however, not of very great importance in this connection, for the cost of loading and unloading is only a

[1] "A large amount of testimony was given to show the relative average cost of handling and loading freight in carloads and less than carload. . . . The testimony is too voluminous to set forth more than some of the results shown.

. . . . . .

"The cost of loading miscellaneous freight [at Duane Street, New York, and Docks 5 and 6 at Jersey City] is from 42 to 46 cents per ton, or from 2.1 to 2.3 cents per hundred pounds, greater than loading carload freight.

"The relative cost of unloading and delivering carload and less than carload freight at Chicago was shown to be 23 cents a ton for less than carloads and 9 cents per ton for carloads, or seven-tenths cents per hundred pounds." Thurber *v.* N. Y. C. & H. R. R. Co., 2 Inters. Com. Rep. 742, p. 748; 3 I. C. C. Rep. 473 (1890).

"The carriers further justify these differentials by difference in cost of service. It is obvious that the actual expense of handling less than carload business is greater than it is for carload traffic. The carload is generally loaded and unloaded by the shipper, while the less than carload is handled at both ends by the carrier. In the former case there is but one entry for each carload, while in the latter there are from 25 to 150 in case of each car which must be extended upon all books where a minute of the transaction is entered. The expense of providing station facilities is very much greater in the case of less than carload than carload business." Business Men's League of St. Louis *v.* A. T. & S. Fe R. Co., 9 I. C. C. Rep. 318, p. 345 (1902).

fraction of the direct cost. The expense of handling varies (1) with the size and form of the packages, and (2) with the characteristics of the goods themselves.

In considering the difference in the cost of handling different packages it must be remembered that it requires several men to load large and bulky freight, while small packages can easily be handled by one man. When heavy and bulky freight is loaded and unloaded by the carrier, the additional expense to which it is put should rightly be taken into account, but when this work is done by the owner of the freight, as is often the case,[1] the expense to the carriers is reduced and due allowance should be made therefore. While there may be slight difference in the cost of handling boxes and barrels, they are, in the absence of reasons to the contrary, always given the same class. Barrels with cloth tops require more time to load than those with wooden heads because of the additional care required. Goods frequently shipped in small packages, say about twenty-five pounds each, should not be given a higher rating on that account.[2] On the whole it might safely be said that the method of packing does not affect the cost of handling as much as it affects the amount of risk taken by the carriers. Some goods, though not heavy or bulky, on account of their exceptional length, cause additional expense in handling. Thus long ladders cannot be loaded through the side door of an ordinary box car, but must be taken through the small end door. This requires extra time and might even necessitate switching the car.

The character of some freight is such that it cannot be loaded as quickly as other kinds and therefore puts the carriers to greater expense. It requires longer time to load

[1] "Owners will be required to load and unload L. C. L. [less than carload] shipments of heavy or bulky freight, such as cannot be handled by station employees." Official Classification No. 35, Rule 8-B, page 11.

[2] "The comparatively light 25-pound package may be easily and quickly handled, while a case weighing 500 pounds is a heavy and cumbersome article." Page *v.* D. L. & W. R. Co., 6 I. C. C. Rep. 548, p. 572 (1894).

light and bulky freight than it does to load an equal tonnage of freight which has great density, and the same is true of fragile articles on account of the additional care which must be exercised. Again, freight which can inflict damage on other goods must be stored away carefully in the car. Hooks can often be used to very good advantage in handling bales of cotton waste, and other goods that cannot be injured thereby.

A sixth element affecting the minimum rate is made up of several items which may well be termed special requirements. These special requirements entail additional expense. They can be considered under the following headings: (1) special service, (2) special equipment, (3) special terminal facilities, and (4) special expense.

Probably the most important special service rendered by carriers is that of high speed, required in the movement of perishable freight. This fast service is more expensive than the ordinary service. Trains running on the fastest schedules carry only about half as many cars as those on slow schedules,[1] while the coal consumed and the number of men required are about the same. It is claimed that the men on the fast trains receive higher wages than others, and that running at greater speed causes greater wear on track because of heavier pounding of the wheels upon the rails.[2] Whenever necessary, slow trains are side

[1] Schedule of time made by the Southern Railway from Georgia points to Alexandria.

Peaches	23 miles per hour.
Vegetables	19.4 " " "
Fast freight	15 " " "
3d class trains	12 " " "

South of the Potomac a locomotive usually hauls twenty or more cars, but at peach schedule only ten. On the Pennsylvania Road twenty-five cars make a train on the peach schedule, while otherwise about forty-five are hauled and the engine pulling twenty-five burns about as much coal as the one pulling forty-five. Georgia Peach Growers' Ass'n *v.* A. C. L. R. Co., 10 I. C. C. Rep. 255.

[2] Florida Fruit Exchange *v.* S. F. & W. R. Co., p. 404 of 3 Inters. Com. Rep.

tracked, often from one to two hours, in order that the tracks may be cleared for the fast trains. As offsets to the increased cost of fast service, it should be mentioned, first, that by the doubling of the speed, the time of each man on the run is reduced by half. Likewise interest on investment in equipment is greatly reduced. While it thus appears that the cost of running a train varies directly and in almost the same proportion as the speed, it must be remembered that this cost is only that of moving the train and some additional wear and tear on track and equipment, and by no means the total costs.

Another form of special service is promptness in delivery of the freight at the destination. This promptness is made necessary by conditions of the commission markets in large centres. Because of the close attention that this traffic requires it is more expensive to the carriers than is other service, but as the carriers do not assume responsibility for delays[1] nothing should be added to cover additional risk. Another item of special service, though of only slight importance, should be mentioned, namely, persons in charge of some kinds of freight, especially live stock, are given free passage and also free transportation for the return trip. While the additional expense caused the carriers on this account is only slight, it may properly be taken into account. This item is, in fact, an extreme form of dead weight.

The second item of special requirements is special equipment. Along with the great improvements in transportation of the last years has come equipment which is especially fitted for the peculiar requirements of some freight. Thus refrigerator cars have been provided for perishable goods, tank cars for oils, furniture and vehicle cars for large and bulky freight, and palace stock cars for cattle. This special equipment has made possible the movement of some commodities and has greatly facilitated the movement of others.

[1] See any uniform bill of lading.

With it, however, may come an additional expense which should be borne by the commodities that have reaped the benefits. It has already been pointed out that dead weight is increased by this equipment. Besides this, some of the special cars are more expensive than ordinary ones,[1] and also because they are more apt to be returned empty and otherwise be idle, there is a larger amount of interest on investment to be earned by each unit shipment.

Special terminal facilities include side tracks, loading stations, warehouses, etc. When these are provided for any particular commodity, that commodity should bear the additional expense thereof. Only two cases in which such facilities have been provided need be mentioned. The melon industry of South Carolina requires special sidings which must be moved from year to year,[2] and extra stations, with agents, operators, switchmen, and freight handlers, must be provided during the shipping season of the Georgia peach crop.[3] While the cost of providing and maintaining these special terminal facilities must be taken into account, the fact that a commodity is handled by means of such special facilities does not necessarily mean an increased expense. Some commodities move in such vast volumes that cheaper facilities for handling can be provided. This saving, however, is possible only where the commodity is produced in large volume in any one place. As many commodities which are produced in large quantities in single localities are also produced in small quantities at other places, the saving is of little importance in determining classification, but rather applies to com-

[1] Railroads pay ¾ cent or one cent per mile for a refrigerator car rented from the Armour Company, while they allow each other six mills per mile for the use of stock cars. Georgia Peach Growers' Ass'n *v.* A. C. L. R. Co., 10 I. C. C. Rep. 255 (1904), and Chicago Live Stock Exchange *v.* C. Gt. W. R. Co., 10 I. C. C. Rep. 428 (1905).

[2] Board of Railroad Commissioners of So. Carolina *v.* F. R. R. Co., 8 I. C. C. Rep. 1.

[3] Georgia Peach Growers' Ass'n *v.* A. C. L. R. Co., 10 I. C. C. Rep. 255 (1904).

modity rates. In considering the expense caused by special terminal facilities, allowance should be made for the fact that the regular terminals are probably thereby relieved of considerable work.

The item of special expense which has the widest application is that caused by the necessity of stopping trains at every small station and holding them while less than carload freight is being loaded and unloaded. These stops cause idleness of equipment and loss of time of the train crew. Not all of the time of the train crew during such stops, however, is lost, because some of the men do the loading and unloading and thereby save the expense of station hands. As a large per cent of the less than carload freight is carried considerable distances and in through trains, this waste from stops is not caused by all less than carload shipments.

There are other items of special expense which usually belong to particular commodities. Thus on the approach of the strawberry season, refrigerator cars are "parked" on side tracks so as to be on hand when needed. Just before being used they are brought to the icing station to have the air in them cooled, and after the loading has been completed, they must be taken back to the icing station.[1] Carriers pay for spraying hogs while in transit, and must clean stock cars each time they are used. In connection with the shipment of packing-house products, carriers furnish a man to check the load into the car. They also pay for labor in re-icing.[2] Mixed carload shipments of fruit for several consignees are unloaded by the carriers at their expense,[3] and in winter warm storage is required.

The element of special requirements is subject to some limitation; for while it is recognized that "where a special

[1] Ozark Fruit Growers' Ass'n *v.* St. L. & S. F. R. Co., 16 I. C. C. Rep. 106 (1909).

[2] Board of Trade of Chicago *v.* C. & A., 3 Inters. Com. Rep. 233.

[3] Wholesale Fruit and Produce Ass'n *v.* A. T. & S. Fe R. Co., 14 I. C. C. Rep. 410 (1908).

service is required of the carrier, such as rapid transit and speedy delivery in case of perishable freight, a higher rate than for the carriage of ordinary freight is warranted," [1] it is also true that where the extra expense has been voluntarily assumed by the carriers in their competition for business, these special requirements cannot be accorded a controlling relation to the rate,[2] though entitled to a fair consideration.

In conclusion it may, then, be said that the elements affecting the minimum relative rate are: (1) dead weight; (2) car capacity; (3) movement of traffic; (4) risk assumed by carriers; (5) handling of freight at terminals and transfer stations, and (6) special requirements. The element of dead weight affects only the expense of hauling, and car capacity reduces this same item of expense by the law of decreasing costs. While both of these elements are important, they are not as important as has been held, and an undue emphasis upon them results in serious discriminations. Direction of movement may increase the cost by increasing the amount of dead weight in the form of empty cars, while regularity of traffic reduces the waste caused by idleness of both men and equipment. Because some freight is subject to damage or loss in transit, the carriers are subjected to expense to reimburse the shippers. An allowance to cover this expense is in reality a premium for insurance of the freight while in the hands of the carriers. The handling of freight at terminals and transfer stations is of importance in considering the carload and less than carload rates for the same commodity, but is also, though to a less extent, an element in determining the relative cost of handling different kinds of less than carload freight. Special requirements add directly to expense. It has several

[1] Loud *v.* So. Car. R. Co., 4 Inters. Com. Rep. 205; 5 I. C. C. Rep. 529.

[2] Railroad Commission of Florida *v.* S. F. & W. R. Co., 3 Inters. Com. Rep. 688, p. 700, 5 I. C. C. Rep. 13 (1891).

times been found important to notice especially how and to what extent these various elements affect a direct cost, and errors arising from a failure to do so have been pointed out. While an attempt has been made to show the importance of each, this has not always been possible, for with one commodity a certain element may be controlling, while with another the influence of this particular element may be negligible.

CHAPTER IV

ELEMENTS OF REASONABLENESS — COMPETITION

THE preceding chapter has been devoted to a discussion of the elements which need to be considered in determining the relative minimum rate. The present chapter will be a consideration of those elements which affect the second fundamental principle of classification, namely, that the indirect costs shall be reasonably distributed among the various unit shipments. Before doing this, however, it will be necessary to get a clear conception of what interests are affected by classification and the rights of each of them. The Interstate Commerce Commission has said: "The reasonableness of a rate must consequently be ascertained in every instance in which the question arises, by its relation both to the carrier and to the shipper."[1] And in Business Men's League of St. Louis *v.* A. T. & S. Fe R. Co.[2] it was said: "The controversy has been conducted by the railways and the two sets of wholesalers already referred to, but it must

[1] Delaware State Grange *v.* N. Y. P. & N. R. Co., 3 Inters. Com. Rep. 554, p. 561; 4 I. C. C. Rep. 605 (1891). In the same case they said: "Conflicts about rates arise from the conflicting interests of carriers and shippers. As carriers make their own rates, they have primary regard for their own interests, and often give less weight than they ought to the interests of those they serve. This is more frequently the case in the absence of competition. Under the stress of competition, or sometimes for the purpose of developing business, rates that are equitable or even very low are likely to be made. But when a controversy arises between the public and a carrier, the question of the reasonable limit of a rate usually involves many considerations, and is often difficult to determine. A rate that might be regarded as reasonable and just by a producer and shipper might, from a carrier's standpoint, be deemed extremely unreasonable and unjust, and so, conversely, a rate that a carrier might claim to be reasonable in itself, and that it might support with strong reasons based upon the cost of the service, the quantity of the business and the characteristics of its line of road, might exhaust the greater part of the proceeds of the producer's commodity and be destructive to his interests."

[2] 9 I. C. C. Rep. 318, p. 362.

not be decided with reference to their necessities or desires alone. There is another interest seldom represented upon these hearings, but always to be considered by this Commission, and that is the consumer. No adjustment of rates in the interests of carriers or of wholesalers should be permitted if it antagonizes unduly the public welfare."[1] Thus there are three interests that must be considered in determining the reasonableness of a classification: the carrier, the shipper, and the consumer, or the public. What are the respective rights of each of these three? The interests of carriers demand that the income from an entire schedule of rates shall pay a fair profit on capital invested, provided, however, that such investment has been judiciously made. This is almost entirely an element pertaining to absolute rates, for it often makes little difference to the carrier from what traffic the revenue is derived as long as it is earned. And still, this is not entirely true, for no regulation of freight rates is economic unless it provides some means of encouraging carriers to use improved methods and stimulate traffic, — unless it recognizes the business skill and enterprise of the traffic manager. Therefore the interests of carriers demand that if a reduction in the classification of an article will increase its movement, and thereby increase their profits, they shall be free to make such change, provided that this freedom does not interfere with the rights of shippers and of the public.

There are things which carriers, as public servants, have no right to do. First, they "have no right to advance a rate, which is already reasonably high and which yields

[1] "The questions involved in these cases, like most transportation questions, are complicated by conflicting interests on the part of persons engaged in trade and commerce, and of localities in different portions of the country. They cannot be disposed of with sole reference to the interests of any one class of persons or one part of the country, but must be determined with due consideration of all interests, but more especially those of the general public, embracing, in their greatly preponderating number, the producers and the consumers of the traffic, but without injustice to the transportation agencies." Thurber *v.* N. Y. C. & H. R. R. Co., 2 Inters. Com. Rep. 742, p. 750; 3 I. C. C. Rep. 473 (1890).

an adequate return for the service rendered, solely because additional revenue is needed."[1] Second, as has already been suggested, in reducing a rate in order to increase their traffic they must consider the effect of such reduction upon other industries. To illustrate, carriers between Missouri River points and Chicago had reduced the rate on packing-house products and fresh meats without a corresponding reduction in the rate on live stock. The change was justified by them, among other reasons, because by favoring the packers at the Missouri River points the packing would be done there instead of at Chicago, which would result in additional traffic on account of the coal, cooperage, salt, ice, etc., which would have to be shipped westward.[2] Other limitations in the rights of carriers will be found throughout the discussion on reasonableness. Altogether, it can be said that a public carrier cannot regulate rates or impose conditions which are intended to further its own interests when by so doing unjust and unreasonable discrimination results.

The interests of shippers demand that traffic be so classified and charges so fixed that the burdens of transportation are justly distributed among the different articles shipped. Each shipper should pay no more than a fair price for the service rendered. Some traffic managers hold that each industry pays what it can without reference to what others pay. This is not the principle upon which classifications are based, nor can it be upheld by any proper

[1] Central Yellow Pine Ass'n *v.* Illinois Central R. Co., 10 I. C. C. Rep. 505, p. 506 (1905).

[2] Board of Trade of Chicago *v.* C. & A. R. Co., 3 Inters. Com. Rep. 233. 4 I. C. C. Rep. 158 (1890).

"It is undoubtedly true that the Chicago Great Western Company has a right to change its rate on packing-house products for the purpose of increasing its business, but that right is qualified by the prohibition that that company shall not unduly discriminate against another kind of traffic. . . . As it appears to us, a contrary holding would be equivalent to saying that a quasi-public servant may use its franchise for the purpose of building up some markets and destroying others, if in its judgment its stockholders will be benefited by such action." Chicago Live Stock Exchange *v.* C. G. W. R. Co., 10 I. C. C. Rep. 428, pp. 452 and 453 (1905).

standard of justice. The Interstate Commerce Commission has said: "Manifestly in determining what freight rates shall be borne by different commodities an attempt should be made to obtain a fair relation between those commodities, and a classification which utterly ignores all considerations of this kind, or which utterly fails to give due weight to such considerations, is unjust and unreasonable." [1]

The general public, being the consumer, ultimately pays all transportation charges, and is therefore intimately interested in the reasonableness of the classification. Often it makes little difference to competing producers what rates they pay as long as they are on the same basis, but this is not true of the consumer. While the consumers' interests, like those of the carriers, are mostly concerned with absolute rates, their interests must also be considered in making relative rates, as will be seen later. From the point of view of the consumer two things must be secured. "First [these] commodities should be brought to the consumer at the least possible expense. Second, in both transportation and distribution unfettered competition should be maintained, thereby securing to the consumer the benefits to which he is entitled." [2]

In considering these three interests, the carriers, the shippers, and the public, it must be remembered that because "classification and rates must be general, an injurious effect in some cases and to some interests is unavoidable, but so long as in the main they are satisfactory the rule applies that the good of the greater number is paramount." [3] With this understanding of the interests that

[1] Myer *v.* C. C. C. & St. L. R. Co., 9 I. C. C. Rep. 78 (1901).
"It is evident therefore that even in cases where the need of additional revenue is apparent the carrier cannot arbitrarily select some one or more articles upon which to apply higher rates regardless of the relation which such article or articles bear to other commodities offered for transportation." Nat'l Hay Ass'n *v.* L. S. & M. S. R. Co., 9 I. C. C. Rep. 264, p. 304 (1902).

[2] Business Men's League of St. Louis *v.* A. T. & S. Fe R. Co., 9 I. C. C. Rep. 318, p. 363 (1902).

[3] Thurber *v.* N. Y. C. & H. R. R. Co., 2 Inters. Com. Rep. 742; 3 I. C. C. Rep. 473 (1890).

must be considered, it is possible to take up the discussion of the elements which determine the reasonableness of a classification.

By far the most important element of reasonableness is competition.[1] Considered from the point of view of classification, this competition is of four kinds: (1) between shippers of the same commodity; (2) between localities interested in the same industries; (3) between commodities that can satisfy the same want,[2] and (4) in exceptional cases between carriers.

At first thought it appears that competition between shippers applies only as an element of absolute rates, for apparently a classification is the same to all. There are, however, conditions under which a classification may not be the same to all. It is always offered to all, but conditions may be attached so that it is not always possible for all to avail themselves of its benefits. When tank cars were first used for the transportation of oil, they were owned by the shippers, and the railroads paid the shippers for their use. Oil in tank cars was given a lower rate than oil in barrels loaded in box cars, but the tank cars were not available to the small shippers, and for this reason they could not take advantage of the lower rate.[3] Another means of discrimination between shippers of the same commodity is to provide different rates on freight loaded by different methods, as when an eastern carrier made a lower rate on coal loaded by a tipple (which cost $90,000)

[1] "Railway rates are usually the result of various kinds of competitive influence." Business Men's League of St. Louis *v.* A. T. & S. Fe R. Co., 9 I. C. C. Rep. 318, p. 359.

[2] "Besides these general considerations affecting classification, competition is often an important factor. Such competition includes not only that between carriers, but also the same of a commodity produced in another section, and sometimes the competition of one kind of traffic with another." Nat'l Hay Ass'n *v.* L. S. & M. S. R. Co., 9 I. C. C. Rep. 264.

[3] Rice, Robinson & Winthrop *v.* W. N. Y. & P. R. Co., 3 Inters. Com. Rep. 162; 4 I. C. C. Rep. 149 (1890), also Scofield *v.* L. S. & M. S. R. Co., 2 Inters. Com. Rep. 67; 2 I. C. C. Rep. 90.

than on coal loaded from wagons. This lower rate could not be accepted by the small shipper who did not have $90,000 with which to construct a tipple.[1]

Then, again, a rate may be based upon the condition that a given quantity be shipped at one time, e.g., a carload, a trainload, or some arbitrary amount. It has come to be recognized that a differential in carload and less than carload rates is not only reasonable, but in many cases necessary. The full discussion of this will be taken up later. It has often been argued that special rates should be made for large shipments, as trainloads,[2] because a distinction should be made between wholesale and retail dealers. Judge Noyes[3] speaking of this subject says: "The general principle of an allowance for quantity — a preferential rate for large shippers — is indefensible. A merchant may charge less for his goods at wholesale than at retail. A private dealer may make concessions to obtain a large order. But a railroad is engaged in a business affected with public interest, and must treat all alike. Personal discriminations based on quantity, regardless of difference in cost, are wholly unjustifiable." The Interstate Commerce Commission has said: "The principle involved under lower rates for cargo or trainload quantities than for carload shipments, whether for export or domestic use, violates the

[1] Glade Coal Co. *v.* B. & O. R. Co., 10 I. C. C. Rep. 226 (1904).

[2] See Kirkman, *ibid.*, p. 71. In support of this contention the following from a letter by Mr. C. E. Perkins is quoted: "Railroad transportation is a commodity which is bought and sold as coal is; and to say that it should never be dealt in except at retail prices, or, as has been said, that 1,000 cars should never be shipped at a less rate per car than one train or single car, is the same as saying that coal should be sold as cheaply for one carload as by the cargo making a hundred carloads. It is wholly a question of expediency, to be answered only by those directly interested. To do away with wholesale trading would limit distribution and consumption, and would, in the end, hurt the small consumer. The world needs wholesale traders as much as it needs retail traders. Wholesale prices, whether of transportation or other commodities, so far from being an unjust discrimination, are of the greatest benefit, because they encourage distribution, and make possible the carrying of large local stocks, thus enabling the retail dealer to do a large business on small capital which means a small profit on each transaction."

[3] *American Railroad Rates*, p. 103.

rule of equality and tends to defeat its just and wholesome purpose; and such purpose is not fully accomplished by making all cargo shippers pay the same rate and charging all carload shippers alike." [1]

In the same way a reduction in the rate to a shipper receiving 30,000 tons, or any other arbitrary quantity, of a commodity during a year at one station necessarily causes injustice and is an unreasonable discrimination. "A railroad company if allowed to do so might in this way hand over the whole trade on its road in some necessary article of commerce to a single dealer, for it might at will make the discount equal to or greater than the ordinary profit in the trade; and competition by those who could not get the discount would obviously be then out of the question. So extreme a case would not however be needful to show the inadmissibility of such a discount . . .; the injustice would be equally manifest if several dealers instead of one were able to accept the offer. A railroad company has no right, by any discrimination not grounded in reason, to put any single dealer — whether a large dealer or a small dealer — to any such destructive disadvantage." [2] Even though there may be some saving in cost to carriers because of the large tonnage handled by some shippers, they are not therefore justified in giving lower rates to those shippers. "If carriers were allowed to make differences in rates to equalize differences in cost of transportation, and see fit to do so regardless of the effect upon shippers and localities, the ultimate result must be that the bulk of the traffic will be hauled for comparatively few shippers and from the large centers." [3]

Thus in making rates, carriers are not permitted to make rates of which only a few are able to take advantage

[1] Paynee Bros. & Co. *v.* L. V. R. Co., 7 I. C. C. Rep. 218 (1897). See also New Orleans Live Stock Exchange *v.* T. & P. R. Co., 10 I. C. C. Rep. 327 (1904).

[2] Providence Coal Co. *v.* P. & W. R. Co., 1 Inters. Com. Rep. 363; 1 I. C. C. Rep. 107 (1887).

[3] Glade Coal Co. *v.* B. & O. R. Co., 10 I. C. C. Rep. 226, p. 252 (1904).

or which give an unreasonable advantage to any single shipper or class of shippers, because such discriminations may lead to a monopolization of a particular industry by a few or at least cause great injustice to small shippers.

It was said that a differential between carload and less than carload rates is reasonable. In fact, this is the only well-recognized differential allowed on account of quantity. It might be interesting to note how recent the general recognition of lower rates for carload shipments is and the rapidity with which the idea has grown. The following table shows in percentages the ratings which were (1) only for less than carload, (2) both less than carload and carload, and (3) only carload for various years beginning 1873 and closing 1902 in the territory now covered by the Western Classification.[1]

Year	Less than carload only	Less than carload and carload	Carload only
1873	84.87	11.47	3.75
1878	84.39	14.83	.78
1882	82.12	15.61	2.27
1886	58.95	37.10	3.95
1887	55.26	39.83	4.91
1890	29.70	67.10	3.20
1895	20.50	77.50	2.00
1900	29.50	68.50	1.90
1902	29.41	66.34	4.25

This shows that within a period of about twenty years the idea of allowing lower rates on full carload shipments than on less than carload lots became prevalent.

These differentials are of the greatest importance in the competition that exists between large and small dealers. The large dealer is able to buy sufficiently large quantities to have his goods shipped in carload lots; the small shipper

[1] From *Railways in the United States in 1902*, Part II of *Changes in Freight Tariffs*, p. 38. Issued by the Interstate Commerce Commission.

must buy his stock in less than carload lots. Thus the large dealer has an advantage over the small dealer equal to the differential. There is one class of shippers in particular whose interests are always furthered by very large differentials between carload and less than carload rates. They are the jobbers, who buy from a distant manufacturer and distribute to the retail dealers within their respective territories. Unless the differential is such that the sum of the carload rate from the factory to his warehouse and the less than carload rate therefrom to the dealer's town is equal to or less than the less than carload rate from the factory to the dealer, the jobber works to disadvantage.[1] This leads to cutting off the small dealer and the consumer from buying in small quantities at more distant places and compels them to deal with the jobber in their own immediate neighborhood, and naturally results in an enhanced price to the consumer. Because of the importance of these differentials they must be fully justified and should be determined only after careful investigation of all the conditions affecting them. "A differential, like the rate itself, should be fixed with a view to the just interests of all parties concerned,"[2] and it should be tested by every element of reasonableness.

As no railroad practice can be justified if it does not conform to the law, it becomes necessary to question the legality of these differentials. Speaking of this the Commission has said: "A classification of freight designating different classes for carload quantities and for less than carload quantities for transportation at a lower rate in carloads than in less than carloads is not in contravention of the Act to Regulate Commerce. The circumstances and the conditions of the transportation in respect to the work done by the carrier and the revenue earned are dis-

[1] An illustration of how this works out is found in the Business Men's League of St. Louis Case, 9 I. C. C. Rep. 318.

[2] Business Men's League Case, 9 I. C. C. Rep. 318, p. 358.

similar, and may justify a reasonable difference in rate." [1] The difference in the direct costs of the two services, then, constitutes sufficiently dissimilar circumstances which justify a difference in the rates.

Thus a carload and less than carload differential is legal and may be justified, but this does not mean that carload freight must be carried at a lower rate than less than carload lots are. Commissioner Knapp agreeing in Brownell *v.* C. & C. M. R. Co.[2] said: "If the carload rate is itself reasonable, by whatever standard it may be measured or tested, no legal discrimination results, or can result, from fixing the same basis of compensation for the carriage of smaller shipments." This is so because in administering the Statute "it is obviously unwise to interfere with established usages, unless they plainly offend its provisions and in a substantial degree abridge the rights which it was designed to protect."

While, however, a carload and less than carload differential is permissible it is subject to limitations. In the first place, as the carload and less than carload differentials generally affect competition between large and small shippers, and as "it appears to be universally recognized that the only discrimination which can legally be made between a large shipper and a small one must be based on cost of service," [3] the difference between carload and less than carload rates should as a rule only be in proportion to the difference in direct cost.[4] In other words, less than carload freight should not be made to bear a greater amount of

[1] Thurber Case, 2 Inters. Com. Rep. 742; 3 I. C. C. Rep. 473.
[2] 4 Inters. Com. Rep. 285, p. 292; 5 I. C. C. Rep. 638 (1903).
[3] California Commercial Ass'n *v.* W. F. & Co., 14 I. C. C. Rep. 422, p. 431 (1908).
[4] "The propositions which seem to have been established by the decision (i.e. in the Thurber Case) were, that carload rates, as to some articles under proper conditions and circumstances, were reasonable and not forbidden by the Statute, and that the difference between carload and less than carload rates should only be in proportion to the extra cost or in line of equalization." Brownell *v.* C. & C. M. R. Co., 4 Inters. Com. Rep. 285, p. 289; 5 I. C. C. Rep. 638.

the indirect costs per unit shipped than does the carload freight. In the second place, a differential cannot be so great as to be destructive to competition between large and small shippers. In the Thurber Case [1] the Commission held that "a difference in rates upon carloads and less than carloads of the same merchandise between the same points of carriage so wide as to be destructive to competition between large and small dealers, especially upon articles of general and necessary use, and which, under existing conditions of trade, furnish a large volume of business to carriers, is unjust and violates the provisions of the Act."

A differential rate having been established for carload shipments, its reasonableness may depend upon the minimum weight which is required for its application. General practice is to make the minimum greater as the differential between the carload and the less than carload rates increases, but not in the same ratio.[2] This difference in differentials, varying directly as the difference in minimum weights, depends, as has already been seen, upon the element of car capacity and needs no further discussion. The matter is, however, of the greatest importance on account of the constant increase in the minimum weights. In 1887 the Official Classification provided for a minimum of 20,000 pounds to be used with the first three classes and 24,000 with the last three. At the present time, 30,000 pounds applies unless otherwise provided, but most fifth and sixth class commodities take 36,000 pounds. This increase in minima is important also for another reason. Every increase in the minimum weight means that orders must be correspondingly increased. In time a point is reached at which the small shipper cannot fill his cars to their required minimum

[1] 2 Inters. Com. Rep. p. 742.

[2] "A carrier should receive a greater compensation in the aggregate for hauling a carload of large tonnage than one of less tonnage, yet other things being equal, as a general rule, the rate per hundred pounds should be less in the latter case." Murphy, Wasey & Co. *v.* Wab. R. Co., 3 Inters. Com. Rep. 725; 5 I. C. C. Rep. 122, cited in Potter Mfg. Co. *v.* C. & G. T. R. Co., 4 Inters. Com. Rep. 223, p. 227; 5 I. C. C. Rep. 514 (1892).

and therefore is compelled to pay for weight not carried. This causes an unjust discrimination against him and the differential rate is then unreasonable. Carried to its logical end, the present tendency will result in crushing the weak by the strong with the aid of the public carriers.

The highest minimum that should generally be fixed for any commodity is the maximum weight thereof that can be loaded. "It would manifestly be unjust, under any rule as to minimum loads or otherwise, to charge for weight not carried in a car which the carrier has furnished and in which on account of its size and the nature and bulk of the freight the required minimum cannot be loaded. There may of course be some exceptions to such a rule in cases where the freight is extremely light in weight in comparison with its bulk, and of such character as to forbid close packing, but it has proper application to general freight which is usually capable of being shipped in bulk or in bales or boxes." [1]

Again, the reasonableness of a differential between carload and less than carload shipments may be influenced by a rule permitting mixed carload shipments. Such mixed carload shipments are of two kinds, first, those of the same commodity but several owners; second, those of different articles owned by the same party. The first of these may be disposed of by saying that ownership of goods does not affect the rate.

The Commission has ruled that "ownership cannot be made a test as to the applicability of rates, for diversity of ownership does not differentiate the service which the carrier gives." [2] It has also said that "a difference in a rate for a solid carload of one kind of freight from one consignor to one consignee, and a carload quantity from the same point of shipment to the same destination con-

[1] National Hay Ass'n Case, 9 I. C. C. Rep. 264, p. 305. See also Suffern, Hunt & Co. *v.* I. D. & W. R. Co., 7 I. C. C. Rep. 282.

[2] California Commercial Ass'n *v.* W. F. & Co., 14 I. C. C. Rep. 422, p. 430. See also Buckeye Buggy Co. *v.* C. C. C. & St. L. R. Co., 9 I. C. C. Rep. 620 (1903).

sisting of like freight or freight of a like character from more than one consignor to one consignee or from one consignor to more than one consignee, is not justified by the difference in cost of handling." [1]

There seems, however, to be more difficulty in connection with the second kind of mixed shipments. The Commission has upheld the general rule of the Official Classification which provides for such mixing. In so doing it said: "The privilege of shipping small quantities of articles in the same class as a mixed carload is valuable to a great many small shippers and is not to be condemned because it may result in some degree to the advantage of particular manufacturers or to jobbers." [2] It has also refused to compel the Western and Southern Classification Committees to establish such rules. A request that the Southern Classification Committee be ordered to permit the loading of wrapping paper and paper bags at the same carload rate was not granted by the Commission because the complainant was the only one who produced both, while all competitors either made only the wrapping paper or only the bags, and therefore permission to mix the two at the carload rate would cause discrimination between the shippers.[3] In refusing to order a rule for a similar mixing of cereal products with flour in the Western Classification territory, the Commission said: "A mixed carload rate for cereal products or for cereal products and flour that would have the effect of throwing out of trade many competitors of the complainant who manufacture only certain kinds of cereal products, and of centralizing the business in the hands of one or more dealers, should not be granted, when without it, no wrong is done to any one, and the market is open to all competitors." [4]

[1] Thurber Case, 2 Inters. Com. Rep. 742; 3 I. C. C. Rep. 473.

[2] Procter & Gamble Co. *v.* C. H. & D. R. Co., 9 I. C. C. Rep. 440, p. 441 (1903).

[3] Paper Mills Co. *v.* P. R. R. Co., 12 I. C. C. Rep. 438 (1907).

[4] Schumacher Milling Co. *v.* C. R. I. & P. R. Co., 4 Inters. Com. Rep. 373; 6 I. C. C. Rep. 61 (1893). See also Milwaukee-Waukesha Brewing Co. *v.* C. M. & St. P. R. Co., 13 I. C. C. Rep. 28 (1907).

The reason for these apparently contradictory rulings seems to be that where a regulation has been in force during a long period of time, business interests have become adjusted thereto so that any abrupt and material change would produce undue and therefore unlawful discrimination. The Commission in declining to order a change in the Southern Classification so that paper and paper bags could be shipped in mixed carloads at the carload rate said: "The record shows that carload rates are applied on mixed carloads of the articles in question where the transportation is controlled by either the Western or the Official Classification, and that practice may or may not be lawful. . . . But the record also shows that the practice has existed in the Western and Official territories for many years, while it has never prevailed in Southern territory; and where a regulation pertaining to transportation has been in force during a long period of time business interests become so adjusted thereto that any abrupt and material change is almost certain to produce undue and therefore unlawful discrimination." [1]

Where, however, no undue advantage is caused to any shipper, the Commission has ordered a provision for applying the carload rate to mixed carloads of like freight as on celery with other vegetables,[2] and lemons with pineapples.[3]

It can, then, be said that competition between shippers forbids carriers to make rates of which only a few of the shippers can avail themselves because of some condition attached to them, and in particular there shall be no low rates offered on the condition that a large quantity be shipped. Discriminations of this kind are unreasonable because they lead to monopoly in the industries affected by those rates. There is, however, one differential based

[1] Paper Mills Co. *v.* P. R. R. Co., 12 I. C. C. Rep. 438, p. 444 (1907).
[2] Tecumseh Celery Co. *v.* C. J. & M. R. Co., 4 Inters. Com. Rep. 318; 5 I. C. C. Rep. 663 (1893).
[3] Roth *v.* T. & P. Ry. Co., 9 I. C. C. Rep. 602 (1904).

upon quantity, namely, that for carload and less than carload lots. This differential is justified because of the difference in the direct cost, and therefore must be based upon that difference in cost, subject to the limitation that no differential shall be so great as to be destructive to competition. The reasonableness of such a differential may depend upon the minimum weight that must be paid for in order to secure the advantage of that differential, and also upon the effect of the presence or absence of a rule permitting different articles to be shipped in a mixed carload at the carload rate.

The second kind of competition is that between localities producing the same commodities. How this affects classification is well brought out by the packing business. Both Chicago and Kansas City are large packing centers. Kansas City is also a large hog market. These hogs can either be killed in Kansas City and shipped to Chicago and points east thereof, or they can be shipped live to Chicago and packed there for the home and eastern markets. In dressing hogs there is a loss of twenty-eight per cent in weight. Therefore if the rate on live hogs is approximately three fourths of that on the products, other things being equal, the two localities are on the same basis, but if the rate on the products is made lower than that on the live hogs, other conditions being similar, Chicago is put at a disadvantage. As traffic moves in the cheapest form, the relation of rates on raw materials and their finished products may, then, determine in what locality the process of manufacture shall take place.[1] Competition between localities also affects the carload and less than carload

[1] Even though a raw material is only a small part of the finished product, an unjust relation between rates on it and its product may discriminate between competing localities. This was shown in Meyer *v.* C. C. C. & St. L. R. Co., 9 I. C. C. Rep. 78. The complainant was a hatter at Wabash, Ind. His competitors were located on the Atlantic Seaboard, and one of his raw materials, hatter's fur, was received from New York. To a large part of the market, as the Pacific Coast, the rates on the prod-

differential. This is illustrated by an incident which took place a few years ago. A manufacturer of passenger vehicles located in Illinois petitioned the Western Classification Committee to reduce buggies, knocked down and crated, from one and one half times first class to first class rate. The petition was receiving favorable consideration by that Committee when the jobbers at Kansas City requested that the change be not made. If a reduction had been made in the less than carload rate without a like reduction in the carload rate, the carload and less than carload differential would have been materially reduced. It would result that a greater number of buggies would have been shipped in less than carload lots direct from the manufacturer to the dealers in the small towns of Kansas, and consequently the business of the Kansas City jobbers, and therefore also of the city itself, would have been reduced. Thus small differentials give advantage to the manufacturing locality and large differentials favor jobbing centers. This may be carried still further. The large jobber may desire to extend his territory and enter into competition with jobbers in other cities. In such a case he is interested in securing a small carload and less than carload differential so that the jobber who is his competitor and who buys in carload lots will only have a small advantage. All this seems to be a consideration of competition between shippers, and really is so, but it is also competition between localities. This discussion shows that when a locality is interested merely in securing the business of the near-by territory, its interests are best fostered by large carload and less than carload differentials, but if its trade is of such a nature as to tend toward expansion into far distant territories it desires low differentials.

This raises the question as to what are in such cases

uct were the same from Wabash and from the Atlantic Seaboard. For this reason the Wabash manufacturer was at a disadvantage to the extent of the freight charges on the fur from New York to Wabash and the reasonableness of that rate depended upon this competition.

reasonable rates. It will be best to answer this in the words of the Commission. The packing industries, referred to above, had been established and maintained on rates which in "many instances have been lower on the live stock than on the products: and the principle governing this adjustment, namely, that the rates on raw materials shall not be greater than on the products of the material, has been applied in nearly all cases of a similar nature." [1] It is, however, not always true that the raw material takes a lower rate than does the finished product. In deciding upon the reasonableness of relative rates on wheat and on flour the Commission has said: "The maintenance of a parity of rates on wheat and flour between the Missouri River and the Atlantic Seaboard tends to equalize conditions at all points at which flour-milling enterprises exist, and seems on many grounds to be a sound rate policy in that territory." [2]

While it may be found necessary, as above, to maintain a parity of rates to equalize traffic conditions between localities, classification should not be used for the purpose of equalizing natural conditions. The Commission has refused to attempt to overcome advantages which one producer or dealer may have in his geographical location, and to produce equality between competitors in all markets.[3] It has even gone so far as to say that competitors "are entitled from any artificial lessening of their respective advantages by classification or other device."[4] Again: "A place is entitled to its natural advantages, and a carrier may not deprive it of these advantages which fairly belong to it and because of which investments have been made at this point

[1] Chicago Live Stock Exchange *v.* C. Gt. W. R. Co., 10 I. C. C. Rep. 428, p. 451 (1905). See also Board of Trade of Chicago *v.* C. & A. R. Co., 3 Inters. Com. Rep. 283; 4 I. C. C. Rep. 158 (1890).

[2] Butte Milling Co. *v.* C. & A. R. Co., 15 I. C. C. Rep. 351 (1909).

[3] Squire & Co. *v.* M. C. R. Co., 3 Inters. Com. Rep. 515; 4 I. C. C. Rep. 611 (1891).

[4] Schumacher Milling Co. *v.* C. R. I. & P. R. Co., 4 Inters. Com. Rep. 373, p. 379; 6 I. C. C. Rep. 61.

for the purpose of carrying on production in a more profitable manner than could be done elsewhere." [1] On the other hand, while every locality is entitled to any natural advantages which it has, "such natural advantages do not justify a discrimination in rates in favor of the nearby market which would otherwise be unlawful." [2]

Preserving to each locality its natural advantages is the same as saying that the difference in rates shall be based upon the difference in the direct costs. In the case of carload or less than carload rates each unit of the less than carload shipments should bear the same amount of indirect costs as each unit of the carload shipments. In the case of the raw materials and finished products, the raw material should pay a less amount per unit than the finished product because of the loss of weight in the manufacturing process, and the relation between the amounts paid by unit shipments of the two commodities should be inversely as the weights of unit shipments of each.

In considering competition between markets it should be remembered that "it is not the province of carriers to regulate business or build up or destroy markets, but it is their duty to serve business interests equitably and impartially." "The theory of an adjustment of rates to preserve a commercial profit to manufacturers and jobbers in all cases, if accepted as a necessary rule under the Law, and generally applied, would be far reaching in its consequences, and clothe common carriers with a new function, to equalize at their own expense the net results of business operations, without regard to location or the condition of handling or carriage. . . . Such a rule is not admissible, therefore, as one of general application." [3]

Competition of localities, then, affects classification in the

[1] Imperial Coal Co. *v.* P. & L. E. R. Co., 2 Inters. Com. Rep. 436; 2 I. C. C. Rep. 618.

[2] Chicago Live Stock Exchange *v.* C. Gt. W. R. Co., 10 I. C. C. Rep. 428, p. 451.

[3] Thurber Case, 2 Inters. Com. Rep. 742, pp. 755 and 752; 3 I. C. C. Rep. 473.

determination of relative rates on raw materials and their finished products and of the differential for carload and less than carload shipments. In general the rates on raw materials are less than on their finished products, though sometimes they may be the same. In the competition between different localities, carriers must not equalize natural advantages which one or the other locality may have. Their function is to serve the business interests equitably and impartially.

The third kind of competition is that between commodities which satisfy the same want and can, at least to some extent, be used interchangeably. Hay and grain are such articles since they come into competition with each other as food for animals. Bituminous and anthracite coal are to some extent competitive. The anthracite coal is the cleaner of the two, and therefore preferable for use in residence furnaces, but if there be too great a difference in the price, bituminous coal will be substituted. Examples of this kind might be greatly multiplied, but these are sufficient to illustrate the point. Evidently any difference in rates on such commodities will give an advantage to the one receiving the lower rate. On this subject the Commission has said: "We are of the opinion that in the fixing of relative rates upon articles strictly competitive . . . the proper relation should be determined from the cost of the service, and if the difference in this respect between two competitive articles can be ascertained, such rate should be fixed for each as corresponds to the cost of service. This is fair to the carrier, and we believe the manufacturer has a right to demand of the companies that such a relation of rates as to these articles be maintained." [1]

In other words, it might be said that when two competing commodities are hauled between the same points, each and

[1] Squire & Co. *v.* M. C. R. Co., 3 Inters. Com. Rep. 515, p. 522; 4 I. C. C. Rep. 611.

every unit shipment of the one of them should be made to bear of the indirect costs an amount equal to that assessed upon each and every unit shipment of the other, or that the difference between their rates should be the same as the difference between their minimum rates.

Competition between carriers belongs almost entirely to the question of absolute rates, but in some cases it does affect classification, or relative rates. The railroads within any given classification territory are interested in the success of the industries along their lines and are, therefore, inclined to favor them with lower rates. Thus manufactured articles would be favored in the Official Classification, while farm products would receive a like treatment in the Western. A case which more particularly affects commodity rates, but is based upon the same condition, is found in export traffic. The railroads of the West prefer to haul grain to the Gulf ports to be shipped from there to Europe while it is the interest of the Eastern railroads to have the grain pass through the Atlantic ports. In the competition of the Western and Eastern lines for this business, each will make the most favorable rates possible. This, it will be noticed, also becomes a competition between localities, i.e., the seaports through which shipments are made.

Again, competition of carriers, but this time of rail and water carriers, may in special cases affect carload and less than carload differentials. This is seen in the rates between Atlantic Seaboard points and Pacific coast points. Carload rates are subject to water competition because large orders, being for stock, can usually be anticipated, and therefore placed sufficiently far ahead to permit their transportation via the slower routes around South America or via the Isthmus, while less than carload shipments are often emergency orders requiring quick delivery which is only possible by rail. Because of these conditions the carriers meet with water competition in handling the carload shipments, but not in the case of the less than carload lots. This has been

held to justify greater carload and less than carload differentials than might otherwise be reasonable.[1] This also applies rather to commodity rates than to classifications in general, for in no case does water competition affect an entire classification territory.

In all such cases this competition must be recognized, but no definite rule can be laid down to govern. Each case must be decided by itself.

In summing up the foregoing, it may be said that no classification can be said to be reasonable unless it has been made with a consideration of the interests of the carriers, the shippers, and the public. There are several elements which determine the reasonableness of a particular classification, and of these, competition is the one of greatest importance. As applying to classification it may be between different shippers of the same commodity, between localities, between commodities, and, in exceptional cases, between carriers. Other elements of reasonableness will be considered in the next chapter.

[1] Business Men's League of St. Louis Case, 9 I. C. C. Rep. 318.

CHAPTER V

ELEMENTS OF REASONABLENESS, ETC. — CONTINUED

WHILE competition, as discussed in the preceding chapter, is the most important single element in determining classification, there are several others which must not be overlooked. The first of these is the value of the commodity.

There have been some differences as to what, for transportation purposes, the value of a commodity really is. The two following questions have been asked: Is it the intrinsic[1] or commercial value? Is it the value at the shipping point or at the destination? The Commission has answered the first of these in the following words: "It can hardly be expected of carriers that they shall disregard the market value of the articles they carry, and what their manufacturers give the public to understand concerning them, and enter upon the difficult task of an analysis of freight to ascertain its intrinsic value as distinguished from its market value. . . . The value of an article to the manufacturer is the price it commands, and it seems only reasonable that carriers should take into account the market value."[2] The second question arose in connection with rates on cereal products.[3] The shipper claimed that it should be at the place of production, while the carriers held that the price at Chicago was the proper one in that case on account of that being a distributing point. The Commission, in its report, accepted the former view. This seems to

[1] The term "intrinsic value" is used here because it was used by the Interstate Commerce Commission. As used by them it really meant the value of the ingredients of the commodity plus the cost of manufacture.

[2] Warner *v.* N. Y. C. & H. R. R. Co., 3 Inters. Com. Rep. 74, pp. 76 and 77, 4 I. C. C. Rep. 32 (1890).

[3] Schumacher Milling Co. *v.* C. R. I. & P. R. Co., 4 Inters. Com. Rep. 373, 6 I. C. C. Rep. 61 (1893).

be the more reasonable one because if the value is taken at any place but that of production, it includes an item of freight charges, which might make a comparison with the value of some other commodity unjust. An exception to this might be made in the comparison between the consumer's price of an article and the freight charges on that article. The value of a commodity, then, is its price at the place of production.

Accepting these interpretations, how does the value of a commodity affect the relative rate? Freight charges for transporting commodities of high value in proportion to their bulk are relatively small when compared with the price of those commodities, while the charges for low-value commodities are relatively high. For this reason a commodity of high value, other conditions being equal, can bear a higher rate than one of low value without affecting the sale of that commodity. Because of this ability of high-value commodities to stand higher rates than those of low value, rates are usually somewhat higher for the former than for the latter. This was recognized by the Commission when it said: "Rates should bear a fair and reasonable relation to the antecedent cost of the traffic as delivered to the carrier, and to the commercial value of such traffic,"[1] and again when it said: "Lumber rates should be relatively low in view of the fact that lumber is an inexpensive [i.e., low-value] freight."[2] This is the same as saying that the distribution of the indirect costs upon the unit shipments, provided there are no conditions to the contrary, should bear a relation to the values of the different commodities.

It has already been shown that the value of an article has a slight importance in that it affects the cost of the service through the element of risk. It is, however, principally important because of its bearing upon the ability

[1] Loud *v.* So. Car. R. Co., 4 Inters. Com. Rep. 205; 5 I. C. C. Rep. 529.
[2] Central Yellow Pine Ass'n *v.* I. C. R. R. Co., 10 I. C. C. Rep. 505 (1905).

of a commodity to pay a given rate, and as such, under the present practice, is one of the important elements in determining freight rates.[1] And still "while value is a most important element to be considered in fixing rates, it plainly cannot be made an arbitrary standard independent of all other considerations."[2] In fact, a study of the decisions of the Commission shows that the value of the commodity is placed second only to competition.

The use of the element value of the commodity, for the purpose of determining classification, is subject to limitations. In the first place, the rates on different articles do not vary in the same ratio as their values. The difference in the rates on low-value commodities and on high-value commodities is not as great as the difference in their values. Then, as most commodities are produced in different grades it is impossible for the value of each unit shipment to bear the same relation to the rate as that of every other unit shipment, without multiplying the number of rates indefinitely and thereby defeat the very purpose of classification. Carriers can, therefore, be expected to take into account only the estimated average value of shipments.[3] A careful examination of the most important classifications will disclose only a very few cases where different rates are made on the same article on account of actual difference in value, and these cases are only those where

[1] Beale and Wyman in *Railroad Rate Regulation*, p. 567, § 596, say: "In a recent opinion of the Commission [National Hay Ass'n Case, 9 I. C. C. Rep. 264] the bearing of the value of hay upon its classification was considered. It appeared to be the view of all parties that the value of the goods carried was important chiefly on the question of the danger of loss and the amount of the insurance risk." This is certainly an error. The Commission said that value is only of slight importance with respect to risk. Note the following by the Commission in the same case and quoted by Beale and Wyman. "The value of articles most strongly affects determination of rates for their transportation in that the value of the service to the shipper is generally greater upon more costly products." Any idea that the value of a commodity is of only slight importance is entirely misleading.

[2] Grain Shippers Ass'n *v.* I. C. R. Co., 8 I. C. C. Rep. 158 (1899).

[3] See Duncan *v.* A. T. & S. Fe R. Co., 6 I. C. C. Rep. 85; 4 Inters. Com. Rep. 385 (1893).

the value varies greatly.[1] The Commission has only once ordered a rate which was based on a specified valuation, and then only after a court had refused to enforce a former ruling because it ignored the element of value in fixing the same rate on all grades of the article.[2] In a later case,[3] after declining to order a lower rate on a cheap grade of chinaware because the carriers insisted that a classification based upon value was ordinarily incapable of being enforced and resulted in gross imposition and fraud through misbilling, the Commission said: "While, however, we now decline to establish this rating upon the basis of value, it must not be understood that we have reached a final conclusion that such a principle might not with propriety be introduced into the classification of these articles. There is much to commend the idea. The value of china runs all the way from a few dollars per 100 pounds up to hundreds of dollars. There is every reason why the higher grades should bear a heavier transportation tax than the lower grades. If carriers could suggest a workable plan which would accomplish this it would probably meet with the approval of the Commission."[4] The Commission has also refused to order a rate based on difference in value of

[1] The Official Classification No. 35 on p. 160 provides: —

Paintings;
Value more than $2 per pound, 3 times first class,
Value 50c to $2 per pound, double first class,
Value not over 50c per pound, 1½ times 1st class.

[2] Page *v.* D. L. & W. R. Co., 4 Inters. Com. Rep. 525; 6 I. C. C. Rep. 546; 64 Fed. Rep. 723 (1896).

[3] Union Pacific Tea Co. *v.* Penn. R. Co., 14 I. C. C. Rep. 545 (1908).

[4] See also Union Made Garment Manufacturers *v.* C. & N. W. R. Co., 16 I. C. C. Rep. 405 (1909).

The following ought at least to aid in such a plan: "Any person and any officer or agent of any corporation or company who shall deliver property for transportation to any common carrier, subject to the provisions of this Act . . . who shall knowingly and willfully, by false billing, false classification, false weighing, false representation of the contents of the package, or false report of weight, or by any other device or means, . . . obtain transportation for such property at a less than the regular rates then established and in force on the line of transportation, shall be deemed guilty of fraud, which is hereby declared to be a misdemeanor, and shall, upon conviction thereof in any court of the United States of competent jurisdiction within the district in which such offense

new and old articles of the same class because there was no place where a definite line of demarcation could be drawn,[1] and any such reduction in rates is a question of policy for the railways themselves.[2]

The law of decreasing costs as applied to the distribution of the indirect costs is another important element of reasonableness. This affects rates in two ways: (1) by the tonnage, or volume of traffic, of any single commodity or group of commodities, and (2) by indirect traffic.

The aggregate tonnage contributed by a commodity which moves in large volume is well recognized as a factor in determining the rate. The Commission has said: "No rule is more firmly grounded in reason or more universally recognized by carriers, than that the greater the tonnage of an article of traffic the lower should the rate be,"[3] and Ringwalt in *Development of the Transportation Systems in the United States*[4] said: "Upon this condition more than upon any other, railroad managers base their general estimates of cost of transportation."

It was shown in chapter II that for all the railroads of the country about sixty per cent of railroad costs are constant. A large tonnage means that these costs are divided between numerous unit shipments, and as the number of unit shipments increases, the part that each must pay decreases. On account of this reduction in the constant costs per unit,

was committed, be subject for each offense to a fine not exceeding five thousand dollars or imprisonment in the penitentiary for a term of not exceeding two years, or both, in the discretion of the court." Act to Regulate Commerce, part of Section 10.

[1] Whitcomb *v.* C. & N. W. R. Co., 15 I. C. C. Rep. 27 (1909).

[2] National Machinery & Wrecking Co. *v.* P. C. C. & St. L. R. Co., 11 I. C. C. Rep. 581 (1906).

Carriers sometimes make reduced rates on shipments that are returned to the original shipper. In such cases it is necessary to show reference to outbound billing. As some of these rules apply also to new goods that have been declined, the reduced rate is hardly based on the value of the old articles.

[3] Central Yellow Pine Ass'n *v.* I. C. R. R. Co., 10 I. C. C. Rep. 505 (1905).

[4] Page 260.

commodities which move in large aggregate volume are entitled to lower rates. The commodity as a whole bears its just portion of the indirect expenditures. For this reason, among others, lumber, grain, hay, coal, etc., moving as they do in vast aggregate quantities, receive low rates. These may be considered as wholesale rates, and it is only in this connection that the wholesale principle is recognized in rate-making.

Tonnage is not, however, recognized as an element in determining different rates on articles which do not move in sufficiently large quantities to be important articles of transportation. The Commission has said: "The mere fact that one article is of more general use and therefore shipped in greater quantities than another, when each as a rule is shipped in less than carload quantities, and of no considerable difference in bulk, weight, and value, and of no appreciable difference in expense of handling and of haul, constitutes in itself no reason why the first should receive a lower rate than the last. In such a case mere quantity, not measured by any recognized unit of quantity adapted to carriage, and lessening the expense of handling and carriage, cannot be allowed to affect rates in the transportation of property."[1]

By indirect traffic is meant that the transportation of a given commodity results in the future transportation of the same commodity in a different form, or of other commodities related to it. The law of decreasing indirect costs applies in this case also, not because of the large tonnage of the commodity itself, but because of the total tonnage of the commodity plus the tonnage of the indirect traffic which would not have been transported had the commodity not first been carried. By carrying the former, the transportation of the latter is made possible, thereby adding tonnage, which is often able to bear a larger share of the

[1] Harvard Co. *v.* Penn. Co., 3 Inters. Com. Rep. 257; 4 I. C. C. Rep. 212 (1890). See also Warner *v.* N. Y. C. & H. R. R. Co., 3 Inters. Com. Rep. 74, p. 77; 4 I. C. C. Rep. 32 (1890).

indirect costs, per unit shipment than does the original commodity.

Thus raw materials and articles in crude stages of manufacture, to be used for higher development, are very largely given low rates which only pay part of the indirect costs, with the expectation that the transportation of the finished product will contribute its share. Besides the additional tonnage from the finished product, the process of manufacture requires commodities that are subject to transportation. An illustration of this is found in the packing business. The live stock is shipped to the packing house from whence it is reshipped all over the country in the form of dressed meats, lard, etc. In the packing process vast amounts of coal, cooperage, salt, ice, etc., are used, all of which require transportation.

There are other forms of indirect traffic. In the manufacture of soap, various wastes are used and gathered up from over large territories. None of these would be subject to transportation were it not for the soap industry. Fertilizer is another commodity the rates on which are influenced by this element. Its sole use is to increase crops, which in turn provide carriers with heavy tonnage. Again, this principle has greatly aided in the development of the West. The railroads have fixed exceedingly low rates on immigrant movables westbound, with a view to stimulate immigration, and thus build up industry and cause a westbound shipment of supplies and eastbound movement of products. The item of freight on his household goods, especially if carried some distance, is usually a large consideration to the would-be settler, and if the average rate were charged, it would in many cases be impossible for him to go. In cases of this kind, it would seem to be good policy to make rates even lower than enough to cover the direct costs for carrying the shipments. Any difference could be charged to the solicitation account as it will bring large returns in the near future, and cannot

be said to burden other traffic. In the same way, materials used for construction may be given low rates, and products of an infant industry may be favored until a demand for those products has been stimulated and the industry well established. In carrying out this policy, carriers must not, however, establish materially lower rates than they intend to maintain. Such a practice may work injury. A firm may invest a large amount of capital in an industry on the expectation that a certain system of rates will be maintained. As soon as business is fairly established, the carrier can raise the rates on the ground that they were made only as an aid in establishing the business. As the increase is not sufficient to compel termination of the business, the traffic will continue to move, but the industry loses a portion of the reward of the enterprise of its owners to which it is justly entitled.[1] This cannot be permitted.

The reasonableness of the classification of any particular commodity depends upon the classification of similar commodities even though there may not be any competition between them. The Commission has said that "it is like kinds of traffic under similar conditions of transportation which should have the same classification."[2] But the difficulty is to tell just when articles are similar or like kinds of traffic. Some idea thereof can be derived from several specific cases. Celery has been held to be similar to other table vegetables, as cauliflower, asparagus, lettuce, green peas, string beans, oyster plant, eggplant and finer varieties generally which in value equal or exceed celery, but

[1] "It was said by them [the carriers] that these rates were established for the purpose of developing these Tennessee mines and that they were not supposed to be at the time reasonable rates for the service rendered." "These defendants under the circumstances here shown would hardly be warranted in putting in a rate materially lower at the outset than they intended to maintain." Darling & Co. *v.* B. & O. R. Co., 15 I. C. C. Rep. 79, pp. 80 and 81.

[2] Schumacher Milling Co. *v.* C. R. I. P. R. Co., 4 Inters. Com. Rep. 373, p. 379; 6 I. C. C. Rep. 61, p. 74.

dissimilar to berries, peaches, grapes, and green fruit.[1] Building, fire, and paving brick are, for transportation purposes, like kinds of traffic.[2] Rye and barley should, and ordinarily do, take the same rate on account of being similar.[3] Merchandise envelopes are similar to envelopes for correspondence, being made, used, and shipped like an envelope.[4] Raisins have been held to be dried fruit.[5] Blacking daubers are the same for transportation purposes whether with iron or wooden handles.[6]

On the other hand, leather scraps are not similar to leather, being bought and sold as a different commodity,[7] and burial vaults made of cement are dissimilar to those of iron.[8] Lump coal from two different mines, although of different grades, has been held to be similar, while lump coal and mine run or screenings, because the former is used for domestic purposes and the latter for steam purposes, are dissimilar and may have different rates.[9] Cannel coal has been held to be sufficiently like other bituminous coal to be carried at the same rates when those rates are already established, but not to demand the establishment of rates for it alone on the same basis on which rates would be established for ordinary bituminous coal.

The use or uses to which a commodity may be put affects the reasonableness of the classification of that commodity. One phase of this has already been discussed under competition of commodities satisfying the same want. At this time non-competing commodities will be considered.

[1] Tecumseh Celery Co. *v.* C. J. & M. R. Co., 4 Inters. Com. Rep. 318; 5 I. C. C. Rep. 663 (1893).
[2] Stowe-Fuller Co. *v.* Penn. R. Co., 12 I. C. C. Rep. 215 (1907).
[3] Cannon Falls Farmers' Elevator Co. *v.* C. G. W. R. Co., 10 I. C. C. Rep. 650 (1905).
[4] Wolf Brothers *v.* Allegheny Valley R. Co., 7 I. C. C. Rep. 40 (1897).
[5] Martin *v.* Southern Pac. Co., 2 Inters. Com. Rep. 1, 2 I. C. C. Rep. 1 (1889).
[6] Derr Mfg. Co. *v.* Penn. R. Co., 9 I. C. C. Rep. 646 (1903).
[7] Newman *v.* N. Y. C. & H. R. Co., 11 I. C. C. Rep. 517 (1906).
[8] Van Camp Burial Vault Co. *v.* C. L. & L. R. Co., 12 I. C. C. Rep. 79 (1907).
[9] McGrew *v.* Mo. Pac. R. Co., 8 I. C. C. Rep. 630 (1901).

When commodities are distinctly different their rates may vary according to their utilities. Difference may properly be made in the rates on lump coal and on mine run or slack because they are distinct in the uses to which they are put;[1] the former being used for domestic, and the latter for steam purposes.[2]

While utility as applied to different articles is well recognized, it is an entirely different matter when applied to different uses of the same commodity. Traffic managers strongly urge that they should be allowed to make different rates on goods to be used for different purposes. This position is, however, not sanctioned by the Commission. As the element is of considerable importance and has been much debated, it will be given a somewhat detailed consideration.

It was found impracticable to make different rates on the same commodity according to its varying values on account of the difficulty of determining the value of each shipment. In the case of utility the difficulty is even greater. Often it is harder to tell by looking at a shipment what use it is to be put to than what its value is, and for this reason the element loses importance. In all such cases where the use cannot be traced it must necessarily be ignored in making rates.

The Commission has taken the position that different uses for the same commodity do not warrant different rates. In forbidding different rates on nitrate of soda when used as a fertilizer, and when in connection with the manufacture of gunpowder, the following language was used: "This case emphasizes the impropriety of tariffs which apply rates upon commodities according to their use. We have repeatedly condemned such tariffs, and we now say the carrier has no right to attempt to dictate the uses to

[1] McGrew *v.* Mo. Pac. R. Co., 8 I. C. C. Rep. 630, p. 641 (1901).

[2] In Colorado Fuel & Iron Co. *v.* So. Pac. R. Co., 6 I. C. C. Rep. 488, p. 515 (1895); National Hay Ass'n *v.* L. S. & M. S. R. Co., 9 I. C. C. Rep. 264 (1902), and Duluth Shingle Co. *v.* D. S. S. & A. R. Co., 10 I. C. C. Rep. 489 (1905) the uses to which commodities are put were recognized.

which commodities transported by it shall be put. The duty of a common carrier is to transport commodities at its tariff rates and on equal conditions to all. . . . The Commission cannot regard a classification as scientific, or a difference in rates as well based which is altogether founded upon a distinction that has no transportation significance. Such a differentiation would lead to an almost endless multiplication of rates, which could find no excuse except in the use which might be made of the article transported. . . . In Capital City Gas Co. *v.* Cent. of Vt. Co. et al, 11 I. C. C. Rep. 104, the Commission held that it is not permissible under section two of the Act for two carriers to establish a joint through rate which is applicable only to a particular shipper or class of shippers while denying such lower rate to other shippers of like traffic between the same points of origin." [1]

In brief, the above gives four reasons against the practice of basing rates on different uses of the same commodity: (*a*) because it dictates the use to which commodities shall be put; (*b*) such a distinction has no transportation significance; (*c*) it leads to almost endless multiplication of rates, and (*d*) it is contrary to the Act to Regulate Commerce.

These objections by the Commission are not entirely convincing, and as long as some other elements of reasonableness are recognized, there still seems to remain good reasons for making rates that recognize this element. Of course this is only true when the different uses are clearly distinct and widely separated as in the case in question.

The first objection is that it dictates the use to which commodities shall be put. Nitrate of soda as a fertilizer was given a rate a few cents lower than when used in the

[1] Fort Smith Traffic Bureau *v.* St. L. & S. F. R. Co., 13 I. C. C. Rep. 651, pp. 655 and 656 (1908).

"Unless within the authorized exceptions to the general rule of the statute, discriminations in charges upon like shipments of the same commodities based solely upon the purpose or 'business motive' of the shipper are unlawful whether affected directly, or indirectly, by methods of classification." Duncan *v.* A. T. & S. Fe R. Co., 4 Inters. Com. Rep. 385, p. 392; 6 I. C. C. Rep. 85 (1893).

manufacture of gunpowder. This difference in rates did not affect the price of the nitrate of soda at the shipping point, and therefore it was immaterial to the importer whether he sold it as a fertilizer or as a raw material to be used for powder. From the point of view of the consumer, the farmer using fertilizer and the powder manufacturer are not in competition with each other and in fact have no direct relation to each other. For this reason, the small difference in cost on account of different freight rates gives neither an unjust advantage over the other. Used as a fertilizer, the transportation of the nitrate has only a small value because it might be dispensed with entirely, or some other very satisfactory substitute can be found, while as a constituent of gunpowder it can neither be entirely dispensed with, nor can as good substitute be had. Looking at it in this way, it might well be asked if the refusal to permit different rates based upon the uses to which it is put may not more readily dictate the use. For the sake of argument, grant that the rate is so made that it is reasonable when the nitrate of soda is used as a constituent of powder. After this rate has been established it is found profitable to use the nitrate as a fertilizer, provided, however, that the rate on it is made as low as that which applies on other fertilizers. If its different uses cannot be recognized this means a reduction in the rate on it when used as a constituent of powder, and as the tonnage already hauled for that purpose is large, the decrease in earnings caused by this reduction would be greater than any earnings that could be derived from it as a fertilizer. In view of this, carriers would surely not reduce the rate. This would mean that a *refusal* to permit different rates according to the different uses is a dictation that nitrate of soda must continue to be used only in the manufacture of gunpowder and not as a fertilizer. It must further be kept in mind that harmful rate practices based upon differences in use are prevented by the requirement that rates must be

reasonable, which limitation must be equally applied to all other elements of freight rates.

The Commission's second objection, that rates based on different uses of the same commodity have no transportation significance, is best answered by its own rulings. Speaking of different rates based on different values of the same article it said: "There is every reason why the higher grades should bear a heavier transportation tax than the lower grades. If carriers could suggest a workable plan which would accomplish this it would probably meet with the approval of the Commission."[1] Thus the Commission recognizes different values of the same commodity as of transportation significance.[2] Is not the use to which a commodity is put of as great significance as its value?

Further, in speaking of an electrical appliance the Commission said: "We have found that the Scheidel outfit should properly be classified as X-ray apparatus, or as apparatus used for medical or scientific purposes; but if in the future the Ruhmkorff coil manufactured by the complainant should come to be used extensively for commercial purposes; if some demand should arise for the extensive use of a piece of mechanism producing the high tension currents which this does, it might easily be true that the conditions surrounding the manufacture and use of that piece of apparatus would be such as to render it more nearly akin to the present high tension transformer and it might be entitled to the same rating."[3] Here the Commission surely recognizes the different uses of the Ruhmkorff coil as of transportation significance. If in this case why not in the case of nitrate of soda?

In its third objection the Commission is not consistent

[1] Union Pacific Tea Co. *v.* Penn. R. R. Co., 14 I. C. C. Rep. 545 (1908).

[2] Some one may object that the Commission did not grant the rate asked for in the case quoted, and therefore did not recognize value. It is true that the rate was not granted, but the reason for not doing so was the possibility of fraud. Value as an element in making rates was clearly recognized.

[3] Scheidel & Co. *v.* C. & N. W. R. Co., 11 I. C. C. Rep. 532, p. 536 (1906).

with other rulings. It is said that a recognition of different uses leads to multiplication of rates, and yet in the ruling just quoted value (which would have the same effect) ought to be recognized if it were possible. Does the former lead to a greater multiplication of rates than the latter, and even if it should do so, is that sufficient reason why it should be ignored? When limited by the principle of reasonableness, if otherwise merited and if injustice is caused by a refusal to recognize it, the uses of a commodity should not be ignored because rates are somewhat multiplied thereby. It would be just as reasonable to refuse to recognize any other element of freight rates for the same reason.

And lastly, it said that the practice is contrary to law. The Act to Regulate Commerce, section two, requires that all shippers shall be given the same rate for "a like and contemporaneous service in the transportation of like kind of traffic under substantially similar circumstances and conditions." In order, then, to make different rates on the same article based on different uses and conform with the law it must be shown either that the service in all cases is not the same, that the traffic is not of like kinds, or that it is not carried under similar conditions or circumstances. If only one of these can be shown in the case in question, the objection must fall.

Is the traffic alike in both cases? In the one instance the nitrate is a fertilizer competing with animal and other fertilizers, in the other, it is a raw material, for which no satisfactory substitute can be found, entering into a process of manufacture. These are no more the same than are mine run and lump coal, which the Commission has held were different on account of the uses to which they are put.[1] Used as a fertilizer the nitrate has a low value to the consumer, while used as a constituent part of gunpowder it has a higher value to the consumer. That a valuable commodity may for transportation purposes be

[1] McGrew v. Mo. Pac. R. Co., 8 I. C. C. Rep. 630 (1901).

considered different from a cheap one has already been seen.

Hence it is seen that there are good reasons for recognizing different uses of the same commodity, and court cases in which this has been done are to be found.

A lower rate on coal for a manufacturing establishment than on coal for dealers has been upheld in the following language: "In point of fact it is perfectly well known and appreciated that the output of freights from the great manufacturing centers upon our lines of transportation constitutes one of the chief sources of the revenues which sustain them financially. Yet no part of this income is derived from those who are mere buyers and sellers of coal. When the freight is paid upon the coal they buy, the revenue to be obtained from that coal is at an end. Not so, however, with the revenue from the coal that is carried to the manufacturers. That coal is consumed on the premises in the creation of an endless variety of products, which must be put back upon the transportation lines, enhanced in bulk and weight by the other commodities which enter into the manufactured product, and are then distributed to the various markets where they are sold. In addition to this, a manufacturing plant requires other commodities besides coal to conduct its operations, whereas a coal dealer takes nothing but his coal, and the freight derived by the carrier from the transportation of these commodities forms an important addition to its traffic, and constitutes a condition of the business which has no existence in the business of carrying coal to those who are coal dealers only. . . . Another important incident which distinguishes them is that the establishment of manufacturing industries and the conducting of their business necessitates the employment of numbers of workmen and other persons whose services are needed, and these, with their families, create settlements and new centers of population, resulting in villages, towns, boroughs, and cities according to the extent and variety of the industries established, and these in turn

furnish new and additional traffic to the lines of transportation. But nothing of this kind results from the mere business of coal selling. . . . The business of the coal dealer is promoted by the concentration of population which results from the establishment of manufacturing industries, and these two businesses are not competitive in their essential characteristics."[1]

A refusal to permit this distinction in rates may lead to injustice to shippers as well as to carriers. If, as was seen possible,[2] nitrate of soda cannot be used as a fertilizer because of a compulsory system of rates which favors other kinds of fertilizer, the discrimination against the producers thereof is as unjust and unreasonable as if the railroads arbitrarily fixed a higher rate on one kind of fertilizer than on another. Carriers are also subjected to injustice. As long as they do not make any unjust or unreasonable discriminations they should be allowed to make rates which will increase their earnings. By making a low rate on a commodity which has a potential movement, they can induce it to move. The right to make such a rate is very well recognized. If by making a lower rate on a commodity when for a particular use than otherwise applies on such a commodity they can induce a large increase in its movement, and no one is injured thereby, why should they not be permitted to do so?

In conclusion, as long as rates are not based on the cost of service alone, but also on the value of service, the element of different uses for the same commodity should be recognized whenever those uses can be clearly traced, subject, however, to all other elements of reasonableness.

Public economy, as an element of reasonableness of classification, means that carriers must adjust their rates so that the greatest economy will result to the public. How

[1] Hoover *v.* Penn. R. Co., 156 Pa. 220, 27 Atl. 282, 22 L. R. A. 263, 36 Am. St. Rep. 43, B. & W. 410 (1893).

[2] See page 93.

this may be done is illustrated by the following case. On account of wide differences in rates on carload and less than carload shipments from Chicago and the territory east thereof to cities on the Pacific coast, jobbers in the North Central States, who made less than carload shipments into the Pacific coast territory, were unable to compete with the Pacific coast jobbers who received their goods in carload lots. A request was made that the differentials be reduced so as to open up the territory to all jobbers. In disposing of the case the Commission used in part the following language: "No adjustment of rates made in the interests of carriers or of wholesalers should be permitted if it antagonizes unduly the public welfare. Considering the question before us as an economic problem two things should be secured. First, these commodities should be brought to the consumer at the least possible expense. Second, in both transportation and distribution, unfettered competition should be maintained, thereby securing to the consumer the benefits to which he is entitled."[1] Another phase of adjustment of freight rates to secure public economy is found in the words of Commissioner Prouty in dissenting in the Planters Compress Company Case.[2] He said: "My fundamental objection to the decision of the Commission is that it declines to accord to the invention of the complainant any and all opportunity to compete: that it permits the railway to refuse to avail itself of a cheaper method of transportation which would result in the saving of millions of dollars in the cost of transporting the cotton of this country."

It has been argued that freight rates should be adjusted so as to discourage certain methods of production and encourage others because of a difference in the quality of the commodities as produced by the different methods. Thus, it was proposed because a particular method of compres-

[1] Business Men's League of St. Louis *v.* A. T. & S. Fe R. Co., 9 I. C. C. Rep. 318, p. 363.

[2] 11 I. C. C. Rep. 382, p. 419.

sion injures the cotton fibre that method should be discouraged by an unfavorable rate adjustment; [1] that pork is better if packed near the locality where the hogs are raised, and for that reason packing close to the place of production should be encouraged by favorable rates,[2] and because butter made in local creameries is better than that made by the centralizer method, the former should be fostered.[3] The Commission has not recognized any of these as pertinent to classification. To require carriers to fix their rates so as either to encourage or discourage particular processes of manufacture would be the same as asking them to impose upon their patrons the obsolete principles of the Mercantile System.

The laws or practices of trade are elements which may determine the reasonableness of a classification. If an industry is carried on in a way peculiar to itself, such peculiarity is sufficient cause for a deviation from any general practice of rate-making as long as no party or locality is injured thereby. It has been found that sometimes the interest of the greatest number is best subserved by providing the same rate for any quantity that might be offered for transportation because some commodities generally move in less than carload lots while others always move as carloads. This element applies not only to carload and less than carload rates, but with equal force to other conditions of trade. The Commission has held that "it is a sound rule for carriers to adapt their classifications to the laws of trade," and further, that "the fact of an antecedent condition, when no such distinction existed, and perhaps was not required, furnishes no argument for a return to a mode no longer suited to the requirements of the business." [4]

[1] Planters Compress Co. Case, 11 I. C. C. Rep. 382.
[2] Board of Trade of Chicago *v.* C. & A. R. Co., 3 Inters. Com. Rep. 233; 4 I. C. C. Rep. 158 (1908).
[3] Beatrice Creamery Co. *v.* I. C. R. Co., 15 I. C. C. Rep. 109 (1909).
[4] Thurber Case, 2 Inters. Com. Rep. 742, p. 752.

While it is right to adapt classification to the laws of trade, every fluctuation of markets must not be reflected in a classification because freight rates must be comparatively constant. This is especially true of relative rates. If rates are based on the frequent and often unexpected changes in the commercial world, such stability becomes impossible and dangerous situations arise. The Commission has recognized this element of reasonableness in the following terms: "The relation of rates ought to be upon fixed and stable conditions. The fluctuations of markets are so frequent, especially as to competition articles, and oftentimes unexpected, that commercial considerations alone would not furnish a sufficiently stable and fixed rule for guidance in making a rate that should remain substantially permanent through all fluctuations." [1]

In order to establish still further stability of rates, the Commission has ruled that "where an existing classification and rate are not shown to operate injuriously to the carriers from a given point or to give undue advantage to shippers, a change is not justifiable that materially injures an important industry and a class of shippers at that point who have built up the industry in reliance upon a continuation of the previous classification and rate first established and long maintained by the carriers themselves without complaint from any quarter. Such change in classification and rate would subject the person engaged in the industry and the locality and the particular traffic to unreasonable disadvantage within the prohibition of section three of the Act to regulate Commerce." [2] It should be noted, however, that this applies only where the continuance of a classification does not cause injustice to carriers and to any shippers. It cannot be construed as a reason for adhering to an improper classification although its change might work an

[1] Squire & Co. *v.* M. C. R. Co., 3 Inters. Com. Rep. 515; 4 I. C. C. Rep. 611 (1891).

[2] Bates *v.* Penn. R. Co., 2 Inters. Com. Rep. 715; 3 I. C. C. Rep. 447 (1890).

injury to an individual whom the wrong classification had unduly favored.[1] Further, it must not be taken as an "absolute rule requiring for any reason the indefinite continuance of such rate. It is always a question of what under all circumstances is just and reasonable." [2]

The reasonableness of a classification may depend upon whether or not it is weighted with unnecessary restrictions in its application. Such restrictions may be caused by requiring a particular kind of packing which is not justified in order to secure the safety of the goods or other like reasons,[3] and may lead to discrimination between shippers. Even though there be no discrimination, it is not reasonable to compel an outlay of money or an inconvenience which is not fully justified by an economic saving in which the shipper shares.

As a restriction is not necessarily burdensome to the shipper, it need not always be unreasonable. If a carrier makes a much higher rate on an article in cases than when in barrels or kegs in order to prevent fraud,[4] such restriction is not unreasonable, because barrels and kegs are available to all shippers and are as a rule cheaper than cases. A difference in classification based upon the manner of packing, that is, whether loose, crated, boxed, etc., is not unreasonable, because these various methods of preparation for carriage determine the amount of risk, expense of handling, etc. It is also not unreasonable to make even a large difference in rates on condition of conformance with some requirement which is not a burden on the shipper, but which is of great benefit to the carrier, because such

[1] Potter Mfg. Co. *v.* C. & G. T. R. Co., 4 Inters. Com. Rep. 223, p. 226; 5 I. C. C. Rep. 514 (1892).

[2] Green Bay Business Men's Ass'n *v.* B. & O. R. Co., 15 I. C. C. Rep. 59 (1909).

[3] "A shipper should not be subjected to unnecessary restrictions as to the kind of cases or packages he shall use." Rhode Island Egg & Butter Co. *v.* L. S. & M. S. R. Co., 6 I. C. C. Rep. 176 (1894).

[4] See Trades League of Philadelphia *v.* P. W. & B. R. Co., 8 I. C. C. Rep. 368 (1899).

wide difference in rates will shift the burden, as for example of proper packing, on to the shipper, where it belongs.

Speaking of the preparation of a commodity for shipment, it has been held that "if the rate on an article is reasonable to those who ship the great bulk of that article in the form in which it is commonly prepared for transportation, that rate does not become unreasonable to the shipper of a small quantity of the same article merely because he chooses to prepare his shipments in a form which affords the carrier a greater profit per hundred pounds, particularly when the preparation of that article in the more profitable form would impose some degree of hardship upon a large majority of shippers because of its greater expense or for other reasons." [1]

The reasonableness of a rate on an article may depend upon whether that article is a necessity or a luxury. It has been said, and rightly so, that with respect to staple commodities there should be a very intimate connection between the cost of carriage and the rate charged the public.[2] That those who enjoy luxuries are able to and should rightly pay higher rates has long been recognized.[3]

An important element of reasonableness is the relation of the rate to the sale of the commodity. If the cost of carriage constitutes a large part of the ultimate price of a commodity that is sold in large units, the rate is made only a little above the actual cost, while on the other hand, if the cost of carriage is only a very small part of the selling price, and the sale of the article is diffused among the entire community, it may reasonably take a somewhat higher classification than otherwise.

The Commission has said: "There is a marked distinc-

[1] Planters Compress Co. *v.* C. C. C. & St. L. R. Co., 11 I. C. C. Rep. 382, p. 383 (1905).

[2] Commissioner Prouty in Planters Compress Co. Case, 11 I. C. C. Rep. 382.

[3] See pages 18 and 28.

tion between the effect of an advance in the freight rate on an article of merchandise which is commonly sold by the retailer in very small quantities and under conditions where such advance is not likely to burden the consumer, nor to a great extent the dealer, and the case of a like advance applied to an article like hay, which is usually sold by bale or ton and which affects the interests of all concerned in its production, sale, and use."[1]

A classification should not be concerned with minor details. Articles presented for shipment differ in innumerable ways. Each may have several grades with varying values, different densities, or numerous uses. It is impossible to establish with mathematical exactness the burdens that each of these varieties should bear, and even were it possible, a recognition of this multiplicity of values, densities, uses, etc., would defeat the very purpose of classification, namely, simplicity. Only in exceptional cases, when justice demands it, should the general practice of only recognizing important differences be deviated from. "The best that is attainable in this direction is reasonable and substantial approximation."[2] The Commission has held that "a matter so extensive and difficult as classification of freights must evidently be mainly governed by general rules. This is indispensable to any system of classification at all."[3]

A classification must be such as not to open the door to fraud. The possibility of fraud is in some cases a very important factor. It has already been seen that, on account of the possibility of fraud, various grades of the same commodity must be given the same rate although their values range from $5 to $100 per 100 pounds. In carrying out

[1] Procter & Gamble Co. *v.* C. H. & D. R. Co., 9 I. C. C. Rep. 440, p. 454 (1903).
[2] Derr Mfg. Co. *v.* P. R. R. Co., 9 I. C. C. Rep. 646.
[3] Andrews Soap Co. *v.* P. C. & St. L. R. Co., 3 Inters. Com. Rep. 77; 4 I. C. C. 41 (1891).

this element the Commission has ordered the same rate to be applied on fire, paving, and building brick, among other reasons, because they are all the same size and nearly alike in color, and therefore practically indistinguishable. To make a difference in rates on each of these would be to promote false billing on the part of unscrupulous shippers.[1] Fur scraps have been placed in first class instead of second because of the claim by carriers "that this would lead to fraud in the billing of furs as fur scraps."[2]

It is not always true, however, that a rate is unreasonable because it might be fraudulently used. The Commission has said: "While it is true that railways are forced to continually guard against misdescription of property, we still think that something should be left, in the dealings between carriers and the public, to the good faith of both parties."[3]

Closely related to the element of fraud is the requirement that articles be classified as represented to the public. One illustration of this has already been brought out in the definition of value.[4] In discussing this matter the Commission has said: "A manufacturer's description of an article to induce its purchase by the public also describes it for transportation. . . . Carriers are not required to analyze freight to ascertain whether it is in fact inferior to the description or public representation under which it is sold, in order to give it a lower rate corresponding to its actual value. . . . The public is more interested than the carriers in representations made concerning the character and qualities of articles of commerce. . . . The public is entitled to truthful representations respecting goods offered for sale. If an erroneous representation is essential to the

[1] Stowe-Fuller Co. *v.* Penn. R. Co., 12 I. C. C. Rep. 215 (1907).
[2] Myer *v.* C. C. C. & St. L. R. Co. 9 I. C. C. Rep. 78 (1901).
[3] National Machinery & Wrecking Co. *v.* P. C. C. & St. L. R. Co., 11 I. C. C. R. Rep. 581.
[4] See p. 82.

sale of a commodity it is not inequitable that some burden should be a necessary consequence." [1]

This element not only permits carriers to impose higher rates than might otherwise be assessed, it also reduces rates which might otherwise be higher. Thus old canvas, which is bought and sold as junk, must take the rate applied to junk and not the one for canvas.[2]

Before dismissing the principle under consideration mention should be made of some conditions that have been held out as tests of reasonableness, but which cannot properly be so recognized. In the first place, the fact that a commodity moves in a considerable quantity shows that a rate is not prohibitive, but it is not proof that such rate is reasonable. The item of freight charges may be so small a part of the cost of that article that doubling or even trebling the rate might not prevent a single pound from moving. In the second place, under the present system of three great classifications, the fact that a different classification is in force in a different section of the country does not in itself warrant an extension of a lower classification to the section where a higher applies.[3] Conditions are so vastly different in the three sections that a classification which is reasonable in one may not be so in another. In the third place, a shipper's prosperity under an existing classification is no guarantee as to its reasonableness.[4] In other words, "the test of the reasonableness of a rate is not the amount of the profit in the business of a shipper or manufacturer, but whether the rate yields a reasonable compensation for the service rendered. If the prosperity of the manufacturer is to have a controlling influence, this would justify a higher rate on the traffic of the prosperous

[1] Andrews Soap Co. *v.* P. C. & St. L. R. Co., 3 Inters. Com. Rep. 77; 4 I. C. C. Rep. 41 (1890).
[2] Channon *v.* L. S. & M. S. R. Co., 15 I. C. C. Rep. 551 (1909).
[3] Schumacher Milling Co. *v.* C. R. I. & P. R. Co., 4 Inters. Com. Rep. 373; 6 I. C. C. Rep. 61 (1893).
[4] Page *v.* D. L. & W. R. Co. 6 I. C. C. Rep. 548, p. 557.

manufacturer than on that of one less prosperous. The right to participate in the prosperity of a shipper *by raising rates* is simply a license to the carrier to appropriate that prosperity or, in other words, to transfer the shipper's legitimate profit in his business from the shipper to the carrier. The increased prosperity of shippers along the line of a railway enlarges the business of those shippers and, as a consequence, both the tonnage of traffic which they receive in their business and which they ship to their customers. In this way the carrier necessarily and justly participates in, or is benefited by, the prosperity of the shipper." [1]

A rate which is liberal for one commodity is not therefore reasonable for another. "A rate on a particular class of goods which is unreasonable or discriminatory in itself cannot be justified on the ground that the same rate is given on another class of goods and as so applied is liberal and advantageous. The benefit to the one is no proper offset for the injury done the other." [2] Putting this in the concrete, a given rate on cheap unfinished furniture cannot be justified by the fact that the same may be applied to shipments of expensive furniture and when so applied is a liberal rate.

In conclusion it may, then, be said that there are several elements besides that of competition, which determine the reasonableness of a classification, as follows: (1) because

[1] Central Yellow Pine Ass'n *v.* I. C. R. Co., 10 I. C. C. Rep. 505, p. 535. "They [i.e., the railroads] have no right to graduate their charges in proportion to the prosperity which comes to industries whose products they transport. . . . Indeed, to concede the principle for the fixation of rates upon which the railroads through the medium of the Southern Freight Association have acted in this case would concede their power to levy for no better service augmentation of tolls for every increase of profit in every line of endeavor won by the enterprise, sagacity, and industry of the American people. It is superfluous to add that a government of law, and not of men, will never tolerate such domination and control of the trade, manufactures, and commerce of the American people." Tift *v.* Southern Ry., 138 Fed. 753 (1905).

[2] Potter Mfg. Co. *v.* C. & G. T. R. Co., 4 Inters. Com. Rep. 223, p. 228; 5 I. C. C. Rep. 514 (1892).

of ability to pay articles of great value may be given somewhat higher rates than those of low value; (2) by the application of the law of decreasing costs to the indirect costs, commodities moving in a large aggregate volume and also commodities whose transportation results in other traffic may reasonably be given low rates; (3) the reasonableness of the classification of any particular commodity depends upon the classification of similar commodities even though these are not competitive; (4) the uses to which commodities are put is recognized in making rates for different kinds of freight, but different rates for the same commodity depending upon the uses to which it is to be put have not as yet been fully recognized; (5) carriers must adjust their rates so that the greatest economy will result to the public; (6) the laws or practices of trade may be taken into consideration in determining the reasonableness of a classification; (7) as rates and classifications need to be constant they must be based on stable conditions; (8) a classification should not be weighted with unnecessary restrictions in its application; (9) luxuries may be charged higher rates than necessities; (10) the relation of the rate to the sale of the commodity should be considered; (11) a classification should not be concerned with minor details; (12) it must not open the door to fraud, and (13) articles should be classified as represented to the public.

Freedom of movement, classification in another territory, the prosperity of a shipper, and the liberality of a rate under certain conditions are not tests of reasonableness.

CHAPTER VI

COMPARISON, THE METHOD OF CLASSIFICATION

HAVING become somewhat familiar with the principles governing classification, and the elements of which these are made up, it is now possible to consider the method by which classifications are made. This method is comparison, and is made necessary by the fact that the essence of classification is relationship between commodities. The business of the public carrier is not confined to carrying a single commodity, but deals with widely diversified traffic. If the transportation of any particular article was considered by itself, apart from all other traffic, and the charges assessed thereon were merely looked upon as the price for that single service, it might be very low indeed, but when that service is rendered as a small part of a large transportation business, it is apparent that such a charge must be compared with charges on the other freight with which that article is carried.[1] Relationship is, then, fundamental to all classification. At times, it may be so intimate that

[1] "If the question was the mere price, defendants' charge for transporting these surgical chairs from Canton to any of the cities named in the evidence, without regard to the rates charged upon other articles from and to the same points and of other freight carried in the same car or train from which the carrier was deriving revenue, it would without any doubt be a very great service rendered for a very small price, and this would be more or less true of any service rendered by the railroad companies in the transportation of any particular kind of freight for any distance. But the business of a railway carrier is not made up of the transportation of one article only; it relates to the movement of a large and diversified traffic. It results therefore in this as in numerous other instances that a different standard of estimate may be safely consulted, such as that of other freight carried contemporaneously and a comparison of the charge made for other articles in which the same calculations as to value, bulk and expense of handling and of carriage would to a considerable extent enter." Harvard Co. *v.* Penn. Co., 3 Inters. Com. Rep. 257, p. 261; 4 I. C. C. Rep. 212 (1890).

the slightest difference in the relative rates will cause injustice, while at others, it may be so remote that it is almost lost sight of and, in fact, even denied by some traffic managers.

There has been considerable dispute as to what kinds of traffic should be compared. Shippers are often told that it is only like or competing articles that can be compared. On the other hand, when their own interests are best subserved thereby, traffic managers make comparisons between commodities which can hardly be said to be similar. There are, however, several definitely fixed and well acknowledged lines along which comparison is made, as follows: (1) analogous or similar articles; (2) products of the same industry; (3) competing commodities; (4) general use to which an article is put; (5) raw materials and their finished products; (6) degree of perishability of the freight; (7) methods of packing; and (8) classifications in other sections of the country.

It has been held that comparison should be made of analogous articles.[1] This needs some explanation, for what determines the analogy of articles? A study of several rulings shows that the Commission recognizes risk, density, bulk, tonnage, and general character of the freight as elements which make articles analogous.[2]

When the question arises as to which class a commodity shall take, it is proper to compare that commodity as to its general characteristics with articles already in the proposed classes. Thus in deciding whether railroad ties should take fifth or sixth class the Commission compared them with boards, timber, staves, logs, piles, shingles, telegraph poles, etc., in the sixth class and contrasted them with a long list

[1] "The proper method of comparison is the classification accorded by carriers to analogous articles." Brownell *v.* C. & C. M. R. Co., 4 Inters. Com. Rep. 285; 5 I. C. C. Rep. 638 (1893).

[2] "Unreasonable or unjust classification of a commodity is not shown by evidence of lower classification for articles widely dissimilar in the elements of risk, weight, bulk, value, or general character." Brownell *v.* C. & C. M. R. Co., 4 Inters. Com. Rep. 285; 5 I. C. C. Rep. 638 (1893).

of wooden articles, as axles, baseball bats, broom handles, butter ladles, churns, table leaves, shoe pegs, etc., in the fifth class.[1]

A very important relationship between articles is traced through the general industry producing them or the raw material from which they are manufactured. Thus the products of mines, of forests, of cereals, of packing houses, of the dairy industry, etc., are recognized as large general classes. The individual articles of these classes are so closely related to each other that in many cases no discrimination is made even when under other conditions different rates might be charged. The following list of articles taking lumber rates will show how great these differences may be: agricultural implement and vehicle wood in the rough, base boards, bed slats, box lumber or shooks, fence posts, fruit and vegetable baskets, guttering, heading, hoops, pine lath, paving blocks, pickets, sawdust, tank material, telephone poles, well tubing, etc.[2] A perusal of the list shows that such elements as car capacity, value, and use have been ignored.

It must not, however, be understood that the fact that two articles are manufactured from the same raw material

[1] Reynolds *v.* W. N. Y. & P. R. Co., 1 Inters. Com. Rep. 685; 1 I. C. C. Rep. 393 (1888).

In the same way hay has been compared with apples and potatoes (National Hay Ass'n *v.* L. S. & M. S. R. Co., 9 I. C. C. Rep. 264), and surgical chairs with pianos, organs, sideboards, rollertop desks and sewing machines (Harvard Co. *v.* Penn. Co., 3 Inters. Com. Rep. 257; 4 I. C. C. Rep. 212, 1890).

"Necessarily many articles must appear together in a class which bear little relation to each other in all these respects, though some may be of like character while differing in bulk or in value, others have similar bulk while varying largely as to weight or volume and still others present similarity in one or more of the elements mentioned, but have no common relations as to others. The best that can be done under such a scheme of classification is to place two or more articles possessing general similarity in the same class and where an article is not analogous to any other to put that article in the class containing commodities which are most nearly related to it in general character and other essential respects." National Hay Ass'n *v.* L. S. & M. S. R. Co., 9 I. C. C. Rep. 264 (1902).

[2] Rules Circular W. T. L. No. 5, I. C. C. No. 384. Quoted in Duluth Shingle Co. *v.* D. S. S. & A. R. Co., 10 I. C. C. Rep. 489, p. 494 (1905).

is conclusive evidence that they shall have the same rate. Any such idea is far from being correct. Because flour has a greater tonnage than other cereal products, as breakfast foods, etc., it being twenty-five times as great, because the value of these cereal products is one third greater than that of flour, and because flour is carried longer distances and comes into sharp competition with foreign flour, it is entitled to a lower rate than these cereal products.[1]

It has been argued that "no relation can properly be held to exist between different rates on various articles which may contain ingredients from the same raw material . . . if the products do not compete with each other." The Commission failed, however, to recognize this argument in its disposal of the case in which it came up.[2] Besides this the classifications and exception sheets to classifications show that the carriers do recognize a relationship based merely on the raw material from which the articles are manufactured. In the case of articles taking lumber rates, cited above, what competition is there between bed slats and fence pickets, or between vehicle wood and telegraph poles or paving blocks?

While it is not indispensably necessary that articles shall be competitive in order to be compared with each other, if competition does exist that factor must more strongly bring to view the fact of discrimination in rates if there be any.[3] The classification of cement burial vaults has been compared with that of iron vaults[4] because the two articles, while of entirely different materials and having both values and weights widely apart and of different construction, serve the same purpose, and an unreasonably low rate on

[1] Schumacher Milling Co. *v.* C. R. I. & P. R. Co., 4 Inters. Com. Rep. 373; 6 I. C. C. Rep. 61 (1893).

[2] Douglas & Co. *v.* C. R. I. & P. R. Co., 16 I. C. C. Rep. 232, p. 239 (1909).

[3] Harvard Co. *v.* Penn Co., 3 Inters. Com. Rep. 257; 4 I. C. C. Rep. 212 (1890).

[4] Van Camp Burial Vault Co. *v.* C. L. & L. R. Co., 12 I. C. C. Rep. 79 (1907).

the one works injury to the makers of the other. Likewise soap powder should not be classified without a comparison between it and laundry soap.

This does not mean that competing articles should always take the same rates,[1] but only that, where competition does exist, a more careful comparison of the relative demands and advantages of the competing articles must be made.

Articles need not be competing to have relationships through their uses; they may be used in the same general kind of work. This is illustrated by the following cases. The multigraph is a miniature printing press, the printing being done from a cylinder, ordinarily by hand power, though other can be used. The shippers compared it with a printing press, but the Commission held that, because of its office uses, it was more in the nature of an office appliance, like a typewriter or adding machine, and gave it the same classification that was applied to those articles.[2] The second case relates to the classification of an electrical appliance known as the "Scheidel Outfit," [3] which according to the testimony presented is mainly employed in the production of the X-ray, but is also extensively used in medical and scientific work. It was compared with the X-ray apparatus, and also with instruments for scientific use, and given the classification that applied to the latter.

One of the most definite relationships that have been recognized in classifying freight is that existing between the raw material and its finished product. The general practice is to make the rate on the raw material somewhat lower than on the product.[4] The lower rate on the raw

[1] See pp. 79 and 80, competition between commodities.

[2] Forest City Freight Bureau *v.* A. T. & S. Fe R. Co., 13 I. C. C. Rep. 295 (1908).

[3] Scheidel & Co. *v.* C. N. W. R. Co., 11 I. C. C. Rep. 532 (1906).

[4] "Complainant has asked that these wire brushes and brooms be placed in fourth class. . . . The raw materials from which these brushes are manufactured are in fourth class, and no reason appears why these brushes should not follow the general rule of classification and take a

material is on account of the elements of indirect traffic, reduced risk, and lower value, and also because of the waste of part of the material in the process of manufacture reducing the value of the service per unit weight carried. Exceptions to this relation of rates may be found. That of grain and flour has already been mentioned.

When an article is made of several raw materials, some of which have high rates and others which have very low rates, it is clear that the finished product may have as low, or even lower, rate than some of the materials.[1]

As there is a close relationship between the raw material and the finished product, so is there an even closer relationship between the unfinished and the finished article. It is a general practice to give the unfinished article a lower rate than the finished.[2]

This brings up the question, where is the line of demarcation between a raw material and its finished product? The Commission has had occasion to answer this question, the commodity under consideration being hub blocks. Each block is sawed from the trunk of a tree, passed through a turning machine to remove the bark, has a hole bored longitudinally through the heart of it, and both ends dipped into a preparation of rosin and oil to prevent checking. The carriers claimed that these hub blocks were "wagon material unfinished," and being undisputably designed for wagons, the process of manufacture had

somewhat higher rating than is given the raw materials from which they are manufactured." Forest City Freight Bureau *v.* A. A. R. R. Co., 13 I. C. C. Rep. 109, p. 114 (1908).

[1] The cloth of window shades is "so much more valuable than the other usual materials together that the addition of a given quantity of cloth to a variety of much cheaper materials results in a completed article which bulk for bulk, or weight for weight is much less valuable than the cloth, and sending it at the rate per 100 pounds applied to the cloth can hurt no one. . . . If justice is thereby accomplished, the fact that they are exceptions to the general practice is not of itself a valid objection." Page *v.* D. L. & W. R. Co., 6 I. C. C. Rep. 548 (1896).

[2] In Potter Mfg. Co. *v.* C. G. T. R. Co., 4 Inters. Com. Rep. 223; 5 I. C. C. Rep. 514 (1892), the Commission ordered that the rate on unfinished bedroom sets should be eighty-five per cent of that on the finished sets.

already been commenced. The Commission held: "It is conceded, however, that there is a stage in which wood is not to be classed as 'wagon material unfinished,' though designed for the making of wagons, and though something has already been done upon it in the way of preparation. Thus wood for wagon boxes is in a process of manufacture when it is being cut into boards; but it is not then called 'wagon material unfinished.' Indeed, if the boards were to be cut at just the required length and sold for the particular use, they would still be 'lumber.' . . . The process of manufacture, then, is a process subsequent to that which converts the trees into lumber; and it may be added that it is commonly a process which begins some considerable time later, and after the lumber has been seasoned. . . . The manufacture of the particular article begins after the seasoning of the raw material is completed."[1]

As the degree of perishability of a commodity affects the cost of transportation, comparison can be made with this in view. Highly perishable commodities are related to each other because of the similarity of the service required and the risk incurred in their transportation. Thus, while fresh meats and fruits are not otherwise similar, they both require refrigerator service and therefore might properly be compared. Furthermore, commodities otherwise similar may vary greatly in their perishability, e.g., oranges and peaches. The former of these two does not require as fast service as the latter.

Comparison of traffic not otherwise similar is sometimes justified because of the form in which it is presented for shipment. Thus patent medicines in glass, packed in wood, have been compared with acids, apple butter, bronze, condensed coffee, honey, milk foods, ink, oils, pickles, syrup,

[1] Hurlburt *v.* L. S. & M. S. R. Co., 2 Inters. Com. Rep. 81, pp. 83 and 84; 2 I. C. C. Rep. 122 (1888).

In Indianapolis Freight Bureau *v.* C. C. C. & St. L. R. Co., 15 I. C. C. Rep. 504 (1909), the Commission held that japanned castings should take the same rate as those that are not japanned.

and a variety of other articles which are packed in the same way, and the rate was justified on that basis.[1]

Comparison of methods of packing is, however, most often used to establish different rates on the same article when presented for shipment in different forms. The same rate usually applies whether a commodity is in boxes or barrels. If in crates, it is generally one class higher, and if in bales, bags, or bundles still another.[2] These differences in rates depend mostly upon the risk from loss or damage. Rough iron castings, weighing over one hundred pounds each, take fourth class whether loose, crated, or boxed. In this case the crate or box does not add to the safe carriage of the casting and is therefore of no transportation significance.

Until a uniform classification for the entire country is adopted, the rate on a commodity in one section may be compared with that in another. In making this comparison recognition ought to be made of the possibility of errors in the classification with which comparison is made and of conditions which are peculiar to a particular territory.

To summarize, it may, then, be said that the method of classification is comparison, made necessary because each kind of traffic is not an entity by itself, but a part of a large unit. The relationships between these various parts of the whole are at times very remote, at other times they may be most intimate. In the first place, analogous articles, or those having similar general characteristics, are comparable. Products of the same industry usually form a distinct group, and the classification of any one of the products should be compared with that of the other members of the same group. Because of the injustice that might

[1] "There is no apparent injustice in classifying bitters with such articles. . . . To reduce stomach bitters in less than carload lots from the first class under the Official Classification, would be to take them from the position among analogous articles (i.e., those in glass, in wood) which they now occupy." Myers *v.* P. R. Co., Inters. Com. Rep. 403, pp. 406 and 407 (1889); 2 I. C. C. Rep. 573.

[2] Western Classification No. 47, p. 4, Rule 14. Nov. 1st, 1909.

result from a small difference in rates, the classifications for competing articles must always be carefully compared. Articles used in the same business or profession, even though it is not possible to substitute one for the other, are so closely related that comparison between them can be made. As the relative rates on raw materials and their finished products often determine where the process of manufacture is to be carried on, it is of the greatest importance that comparison be made between them. The perishability of a commodity determines the cost of the service, and for that reason causes a relationship which may be recognized. Many commodities are in themselves, as well as in their uses, very dissimilar, but are presented for shipment in like form of packages and therefore subject to comparison. And, finally, comparison may be made between the classifications in the different parts of the country. It must not, however, be understood that these relationships are the only ones which permit comparison. No adjustment of classification can be made without a recognition of the entire scheme. "An attempt to reform a classification by a selection of isolated cases and single classes and changing them without a study of the entire scheme would be dangerous. The entire effect of a change can only be known by comprehending the relation of each particular article or class to the combined scheme." [1]

Merely knowing the relationships that exist between commodities is not enough, it is also necessary to know what comparison is based upon. This is of the greatest importance, for, as will be seen later, much injustice and unreasonable discrimination can result from a comparison on an improper basis.

Comparison should always be based upon the cost of doing the service, and the reasonableness of the apportion-

[1] Schumacher Milling Co. *v.* C. R. I. & P. R. Co., 4 Inters. Com. Rep. 373, p. 376; 6 I. C. C. Rep. 61, p. 67 (1893).

ment of the indirect costs, in the following way. First, the cost of the service should be considered. None of the class rates which are used with the classifications are so low as to approximate the minimum rate, as commodities or particular shipments that require these extremely low rates are provided for by commodity tariffs. For this reason, in making comparison between different commodities, it is usually not necessary to determine the exact minimum rate that each must pay. In fact, because classifications do not show rates in cents per 100 pounds, but merely provide that the rate on one commodity shall be the same, higher, or lower than that upon any other, it is hardly feasible to determine the exact costs but rather the relative costs. It cannot be too strongly emphasized that in making this comparison based upon cost the added costs and not the total costs, which when including the interest on investment is commensurate with the rate, are to be considered. A failure to recognize this will cause great injustice to the commodity, whose transportation is the most expensive to the carrier. In making the comparison, the elements determining the minimum rate — i.e., dead weight, car capacity, movement of traffic, risk, handling freight, and special requirements — must be considered. If any of these elements are the same for the commodities compared, they are disregarded so that only those remain which are of unequal value in both cases. These are then weighed over against each other. To illustrate, two kinds of freight are subject to the same car capacity, movement of traffic, risk, and handling at the terminals. The one requires refrigeration with its consequent large amount of dead weight. In addition, it must be transported by fast freight. The other kind of traffic requires neither special speed nor has it any dead weight in addition to the box car into which it is loaded. To ascertain the relative direct cost, which really is the difference in the two direct costs, of transporting the two kinds of freights, it is necessary to compare the dead

weights with each other and add to the difference the additional expense caused by the high speed.

Having found the relative direct costs of the transportation, all those elements of reasonableness which are applicable in the case in question must be considered, and from the results of this comparison, as well as that of the elements of cost, the rate or class should be determined.

Thus, all of the elements do not apply in each and every case, but no case should be decided without a comparison of all. This manner of comparing commodities is the ideal way and used rather in cases of controversy than in the original classification of a commodity. Railroad officials often, to a large extent, ignore the different elements and determine the classification at what they think can be collected. Often they do it rather by intuition than by comparison.

A very common basis for comparison is revenue earned. While the use of this basis is almost universal, it is far from being scientific, as it ignores the cost of performing the service and many of the elements of reasonableness. Its main forms are: revenue earned per car, and revenue earned per ton per mile.

Shippers are told that the cost of hauling a car is very much the same, irrespective of whether it is loaded to its full capacity or only partly filled, or whether it carries 10,000 pounds of a light commodity or 20,000 of a heavier one, and for this reason the revenue earned should be approximately the same. In the Thurber Case [1] the Com-

[1] "Exact average differences, or the differences upon any particular kind of traffic, have not been shown, and perhaps are not possible, but approximately the difference in cost of transportation as shown by the testimony ranges from 47 to 100 per cent exclusive of handling, loading and delivering, less than carload freights and transfers *en route*, and the average difference in earnings per car from an average load of carload freight and an average load of less than carload freight is not far from 100 per cent. These averages are varied in both directions by differing conditions and volume of business at different points, but the facts show in a general way substantial grounds for a difference in classification." 2 Inters. Com. Rep. 742, p. 752; 3 I. C. C. Rep. 473 (1890).

mission accepted a comparison of revenue earned per car, and made it one of the factors upon which it based its decision. This was also done in Business Men's League of St. Louis *v.* A. T. & S. Fe R. Co. *et al.*[1] In numerous other cases the same method has been employed. After the foregoing discussions of direct costs, and in particular car capacity, it is hardly necessary to say that this basis for comparison is not sound. The revenue earned per car should not be approximately the same in all cases. The revenue necessary to cover direct costs may be approximately the same whether 10,000 or 20,000 pounds of freight are carried, but the 20,000 pound load, other factors besides the elements of cost being the same, should certainly pay double as far as the indirect costs are concerned, which it must be remembered are apportioned upon the unit shipments. But why not consider the carload as a unit shipment? Simply because it is not a constant quantity. The accepted units are 100 pounds or a ton. These are always the same. The car may vary from twenty-eight to fifty feet in length, and from a load of less than 10,000 up to 100,000 pounds. A comparison of the revenue from a 10,000 pound load with that from a 30,000 pound load, for the purpose of fixing the rate, will inevitably result in gross injustice and unreasonable discrimination in favor of the heavier load.

A comparison of revenue earned per ton per mile is subject to the same criticism as comparison of revenue per car, except that it is consistent in using units that are constant. It fails in particular to recognize the element of distance both as it applies to terminal expenses and as decreasing the constant costs per unit distance. Speaking on this subject Albert Fink says: —

"A careful investigation shows that, under the ordinary conditions under which transportation service is generally performed, the cost per ton-mile in some instances may not exceed one-seventh of a cent, and in others will be as

[1] 9 I. C. C. Rep. 318 (1902).

high as 73 cents per ton-mile on the same road. . . . It is impossible to predetermine the cost of carrying freight on any one road, unless the conditions under which it is to be carried, as far as they affect the cost of transportation, be previously known. . . . A mere knowledge of the average cost per ton-mile of all expenditures during a whole year's operation is of no value whatever in determining the cost of transporting any particular class of freight, as *no freight is ever transported under the average condition under which the whole year's business is transacted.*" [1]

Hence it is of greatest importance to base comparison only on the elements of cost and of reasonableness.

In conclusion it may be said that because the essence of classification is relationship, which is sometimes intimate and sometimes remote, the method of classification is comparison. In making comparison, while the entire scheme must be considered, there are certain well recognized relationships existing between different articles of traffic along which the comparison should be made, as follows: analogous, or similar articles, products of the same industry, competing commodities, general uses to which articles are put, raw materials and their finished products, degree of perishability of the freight, methods of packing, and classifications in other sections of the country.

The basis for comparison is the direct cost of performing the transportation service and the reasonableness of the apportionment of the indirect costs, taking into consideration all the elements which affect these two. In practice it is usually not necessary to determine the exact minimum rate, but merely the difference in minimum rates by comparing those elements of the minimum rate which are of unequal value for the commodities compared. Having found the relative minimum rates for given commodities, it is next determined, by a comparison of the elements of reasonableness, how much unit shipments of each shall contribute toward indirect costs.

[1] Annual Report of the Louisville & Nashville Railway Co., 1874.

While it is a common practice to compare revenue earned, either per car or per ton per mile, this practice is subject to criticism. When comparison is based on the revenue earned per car the units of the light weight loads are made to bear a much heavier burden of the indirect costs than are those of the heavier load. Furthermore, the carload cannot be taken as a unit because it is not a constant quantity. A comparison of revenue earned per ton per mile is subject to the same criticism as the former case, except that it is consistent in using a constant unit.

THE END

APPENDIX A

TOTAL RAILROAD EXPENDITURES

THE following table shows the sources of all railroad expenditures, exclusive of payments for dividends, reserve funds, etc. The sub-items for the first four of these main divisions are to be found in Appendix B. Fixed charges include: interest on funded debt, interest on interest-bearing current liabilities, rents paid for lease of roads, taxes, permanent improvements charged to income account, and "other deductions." See Analysis of Railroad Expenditures, pp. 11–13.[1]

SOURCES OF EXPENDITURES	1902	1903	1904	1905	1906	Average
I. Maintenance of way and structures	15.77	15.29	14.20	14.39	14.66	14.86
II. Maintenance of equipment	13.54	13.79	14.52	15.09	15.44	14.48
III. Conducting transportation	38.72	40.33	41.21	40.36	39.32	39.99
IV. General expense.	2.81	2.74	2.80	2.90	2.81	2.81
Unclassified	.02	.02	.04	.03	.03	.03
Total operating expense	70.86	72.17	72.77	72.77	72.26	72.17
V. Fixed charges	29.14	27.83	27.23	27.23	27.74	27.83
Total	100.	100.	100.	100.	100.	100.

[1] Taken from *Statistics of Railways in the United States*, by the Interstate Commerce Commission, 1902 Report, p. 81; 1903, p. 85; 1904, p. 87; 1905, p. 86; and 1906, p. 92.

APPENDIX B

SUB-ITEMS OF RAILROAD EXPENDITURES

THE following table gives the per cent for each of the items which make up the first four main divisions of railroad expenditures mentioned in Appendix A. See Analysis of Railroad Expenditures, pp. 11–13.[1]

ITEMS	1902	1903	1904	1905	1906	Average
I. *Maintenance of way and structures*						
1. Repairs of roadway	11.331	11.093	10.348	10.393	10.726	10.778
2. Renewals of rails..	1.521	1.386	1.298	1.316	1.432	1.391
3. Renewals of ties...	2.838	2.487	2.519	2.657	2.509	2.602
4. Repairs and renewals of bridges and culverts.....	2.593	2.461	2.228	2.319	2.207	2.362
5. Repairs and renewals of fences, road crossings, signs and cattle guards.....	.625	.527	.437	.446	.413	.489
6. Repairs and renewals of buildings and fixtures.....	2.562	2.590	2.147	2.114	2.304	2.343
7. Repairs and renewals of docks and wharves.....	.220	.235	.209	.208	.241	.223
8. Repairs and renewals of telegraphs...	.173	.165	.179	.171	.177	.173
9. Stationery and printing.....	.031	.032	.029	.028	.030	.030
10. Other expenses....	.361	.209	.125	.132	.257	.217
Total....	22.255	21.185	19.519	19.784	20.296	20.608
II. *Maintenance of equipment*						
11. Superintendence..	.601	.559	.567	.565	.561	.571
12. Repairs and renewals of locomotives..	7.246	7.408	7.904	8.290	8.080	7.786
13. Repairs and renewals of passenger cars.....	2.157	2.044	1.951	1.971	1.968	2.018
14. Repairs and renewals of freight cars .	7.432	7.442	7.777	8.199	9.009	7.972
15. Repairs and renewals of work cars...	.245	.242	.231	.242	.268	.245
16. Repairs and renewals of marine equipment.....	.215	.177	.154	.191	.232	.194

[1] Taken from *Statistics of Railways in the United States*, by the Interstate Commerce Commission, pp. 95 to 97 of the 1906 Report.

17. Repairs and renewals of shop machinery and tools	.643	.696	.704	.663	.668	.675
18. Printing and stationery	.044	.046	.042	.043	.047	.044
19. Other expenses	.544	.519	.637	.601	.563	.573
Total	19.127	19.133	19.167	20.765	21.396	20.078
III. *Conducting transportation*						
20. Superintendence	1.711	1.742	1.779	1.803	1.776	1.762
21. Engine and roundhouse men	9.401	9.562	9.550	9.404	9.275	9.438
22. Fuel for locomotives	10.776	11.675	12.128	11.278	11.119	11.395
23. Water supply for locomotives	.623	.614	.659	.660	.650	.641
24. Oil, tallow, and waste for locomotives	.366	.389	.397	.392	.385	.386
25. Other supplies for locomotives	.218	.232	.248	.238	.250	.237
26. Train service	6.737	6.677	6.735	6.536	6.375	6.612
27. Train supplies and expense	1.500	1.552	1.581	1.583	1.557	1.555
28. Switchmen, flagmen, and watchmen	3.984	4.313	4.386	4.336	4.357	4.275
29. Telegraph expenses	1.784	1.754	1.788	1.790	1.751	1.773
30. Station service	6.832	6.664	6.605	6.438	6.307	6.569
31. Station supplies	.676	.667	.686	.646	.611	.657
32. Switching charges-balance	.272	.244	.280	.303	.293	.278
33. Car per diem mileage-balance	1.480	1.400	1.358	1.358	1.231	1.366
34. Hire of equipment, balance	.180	.214	.195	.219	.202	.202
35. Loss and damage	.990	1.094	1.279	1.426	1.375	1.233
36. Injuries to persons	1.048	1.120	1.196	1.156	1.139	1.132
37. Clearing wrecks	.221	.284	.275	.259	.300	.268
38. Operating marine equipment	.721	.745	.696	.714	.685	.712
39. Advertising	.429	.428	.418	.430	.422	.426
40. Outside agencies	1.579	1.449	1.411	1.419	1.352	1.442
41. Commissions	.077	.044	.022	.017	.017	.035
42. Stock yards and elevators	.069	.057	.060	.057	.055	.060
43. Rents for tracks, yards, and terminals	1.519	1.544	1.563	1.727	1.751	1.621
44. Rents for buildings and other property	.440	.411	.382	.347	.321	.381
45. Stationery and printing	.622	.642	.640	.632	.629	.633
46. Other expenses	.416	.376	.353	.318	.245	.341
Total	54.671	55.893	56.670	55.486	54.432	55.430

IV. *General expense*						
47. Salaries of general officers	.925	.823	.841	.842	.826	.851
48. Salaries of clerks and attendants	1.244	1.254	1.313	1.340	1.372	1.305
49. General office expense and supplies	.249	.234	.230	.249	.263	.245
50. Insurance	.412	.432	.471	.496	.481	.459
51. Law expense	.558	.541	.513	.512	.452	.515
52. Stationery and printing for general offices	.168	.175	.170	.176	.182	.174
53. Other expenses	.391	.330	.306	.350	.300	.335
Total	3.947	3.789	3.844	3.965	3.876	3.884

RECAPITULATION

Item	*Average*
I. Maintenance of way and structures	20.608
II. Maintenance of equipment	20.078
III. Conducting transportation	55.430
IV. General expense	3.884
Grand total	100.000

APPENDIX C

AVERAGE WEIGHTS OF FREIGHT CARS

THE following is a list showing the various kinds of freight cars with an average weight for each. See Dead Weight and Car Capacity, pp. 35–47.[1]

	Tons
Box (40,000 to 50,000 capacity)	15
Box (80,000 capacity)	17
Box (80,000 capacity, steel underframe)	22
Vegetable	19
Refrigerator	20
Furniture (40,000 to 60,000 capacity, 40 feet)	16
Furniture (60,000 capacity, 50 feet)	19
Ice	17
Beer	18
Stock	16
Gondola (40,000 to 80,000 capacity)	15
Gondola (100,000 capacity, steel underframe)	20
Flat	13
Ballast	16
Ore (40,000 to 50,000 capacity)	12
Ore (60,000 to 80,000 capacity)	14
Ore (80,000 capacity, steel)	15
Tank	16

[1] From C. & N. W. Ry. (Wisconsin Division) Time-Table No. 276, Jan. 16, 1910.

INDEX

Absolute rates, defined, 2.
Added cost, *see* Direct costs.
Analogous articles: classification of, 89–90; comparison of, 109.

Car capacity: effect on carload and less than carload differentials, 43–44; error in application, 41–43; factors determining, 44–47.
Cargo rates, 66.
Carload and less than carload differentials: affected by car capacity, 43–44, 46; affected by cost of handling at terminals, 52–53; affected by element of risk, 50; affected by stopping trains to unload less than carload freight, 58; reasonableness of, 68–75.
Carload unit, a false basis for comparison, 118–19.
Charging what the traffic will bear, *see* Indirect costs, apportionment of, according to ability to pay.
Classification, *see* Freight classification.
Classification in another section: comparison of, 115; not a test of reasonableness, 105.
Comparison, basis for: elements of cost of performing service and reasonableness of apportionment of indirect costs, 116–18; revenue earned a false basis, 118–20; carload unit a false basis, 118–19; ton per mile a false basis, 119.
Comparison of: analogous or similar articles, 109; classification in another section, 115; competing commodities, 111–12; methods of packing, 114–15; perishability, 114; products of the same industry or raw material, 110–11; raw materials and finished products, 112–14; uses to which articles are put, 112.
Comparison, the method of determining classification, 108–21.
Competing commodities: comparison of, 111–12; proper relation of rates for, 79–80.
Competition between: carriers, 80; commodities, 79–80; localities, 75–79; shippers, 65–75.
Constant costs, *see* Indirect costs.
Cost of service, 9–10.

Decreasing costs, law of, 86–89.
Dead weight: part of shipment, 39–41; separate from shipment, 35–39.
Direct costs: defined, 11, determine minimum rate, 14–17; proportion of total expenditures, 11–13.
Direct costs, difference in, determine: carload and less than carload differentials, 70; difference in rates for competing localities, 78; difference in rates on competing commodities, 79.

Equipment, special, 56.
Expenditures, *see* Railroad expenditures.
Expense, special, 58.

Finished and unfinished articles, comparison of, 113.
Fraud, 103–04.
Freight classification: development